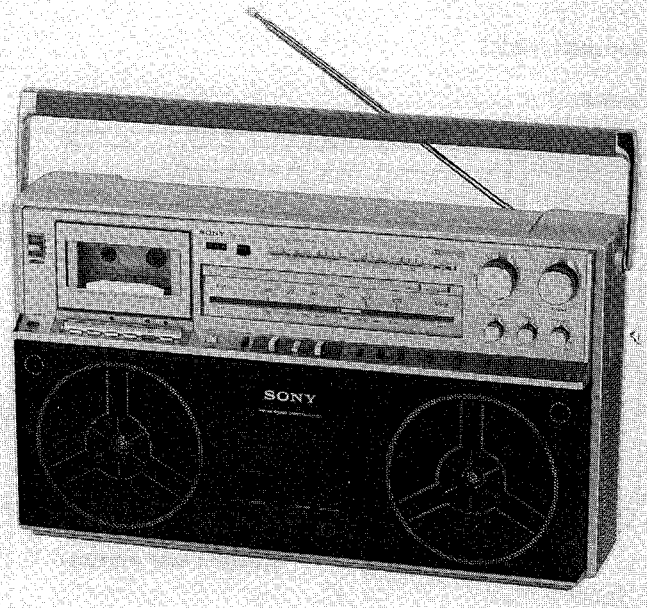
CFS-F5

US Model
Canadian Model



FM/AM STEREO CASSETTE-CORDER

SPECIFICATIONS

Tape recorder section and general

Recording system	4-track 2-channel stereo or monaural
Fast winding time	Approx. 2 min. with Sony Cassette C-60
Frequency response	50–16,000 Hz (with metal cassette, with the IV METAL EQ button depressed and BIAS button depressed)
S/N	DOLBY NR OFF: 40 dB DOLBY NR ON: improved by 5 dB at 1 kHz, 10 dB at above 5 kHz
Total harmonic distortion	5%
Wow and flutter	0,08% (WRMS)
Speakers	Two-way, coaxial type Approx. 16 cm ($6^1/_2$ inches) dia. woofers Approx. 5 cm (2 inches) dia. tweeters
Inputs	Two line input/phono input jacks (phono jack) with the Input Selector set to LINE IN: sensitivity 0.24 V (–10 dB) input impedance 100 kilohms with the Input Selector set to PHONO: sensitivity 4.35 mV (–45 dB) input impedance 50 kilohms One mixing microphone input jack (minijack) for low impedance microphone sensitivity 0.78 mV (–60 dB)
Outputs	Two line output jacks (phono jack) load impedance 10 kilohms or higher rated output 0.44 V (–5 dB) at load impedance 47 kilohms Two external speaker jacks (minijack) for 4-ohm to 8-ohm impedance speaker
Power requirements	120 V ac, 60 Hz 12 V dc, eight batteries size D (IEC designation R20) 12 V car battery with optional Sony Car Battery Cord DCC-120
Power consumption	18 W ac
Battery life	Approx. 12 hours of continuous recording with the Built-in Microphones using Eveready Heavy Duty Batteries No. 1250
Dimensions	Approx. 522×297×132 mm (w/h/d) ($20^5/_8$×$11^3/_4$×$5^1/_4$ inches) incl. projecting parts and controls not incl. handle
Weight	Approx. 6.7 kg (14 lb 12 oz) incl. batteries

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

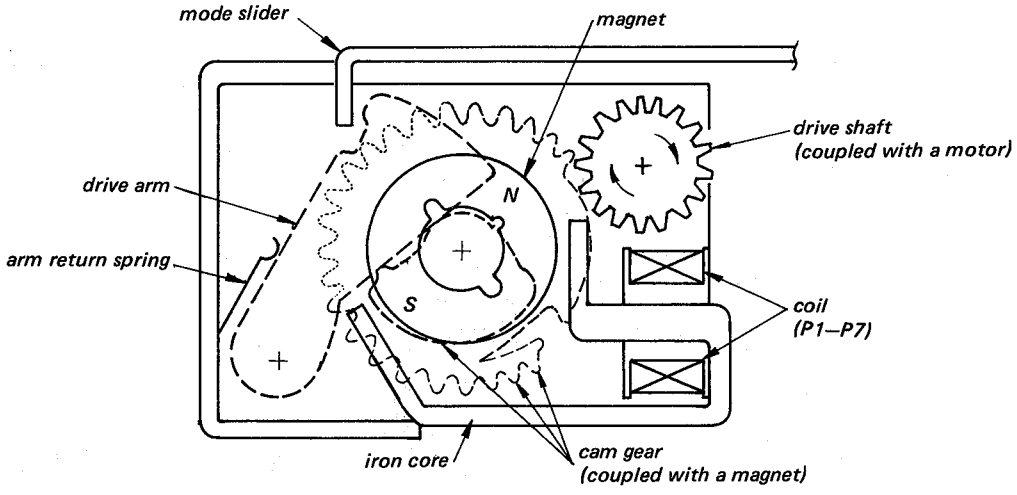
SONY®

SERVICE MANUAL

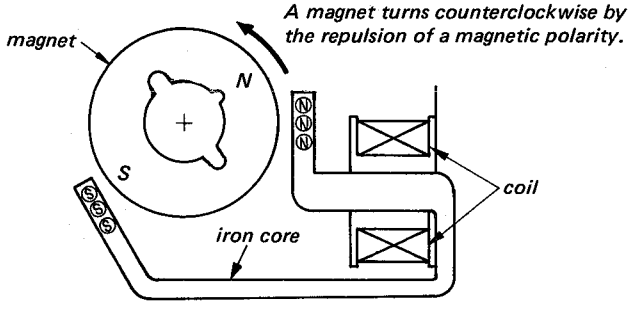
SECTION 1
OUTLINE

Explanation of the mode selection mechanism

1. Static Condition
(There is the same mechanism for each mode)

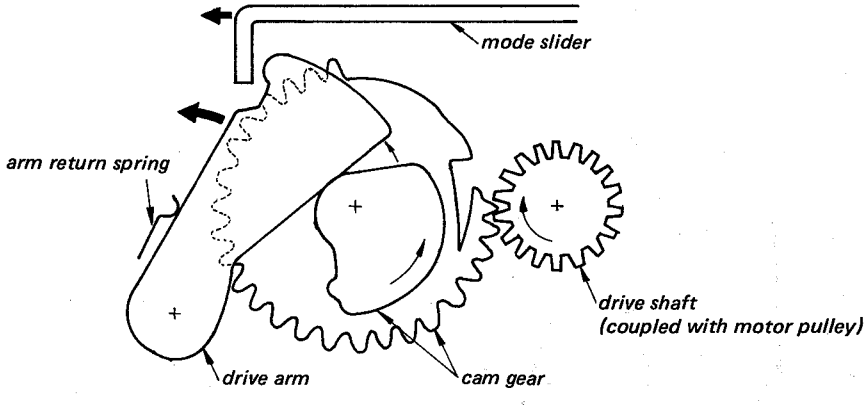


2. When currents flow in the coil



3. After currents flow in the coil (1).

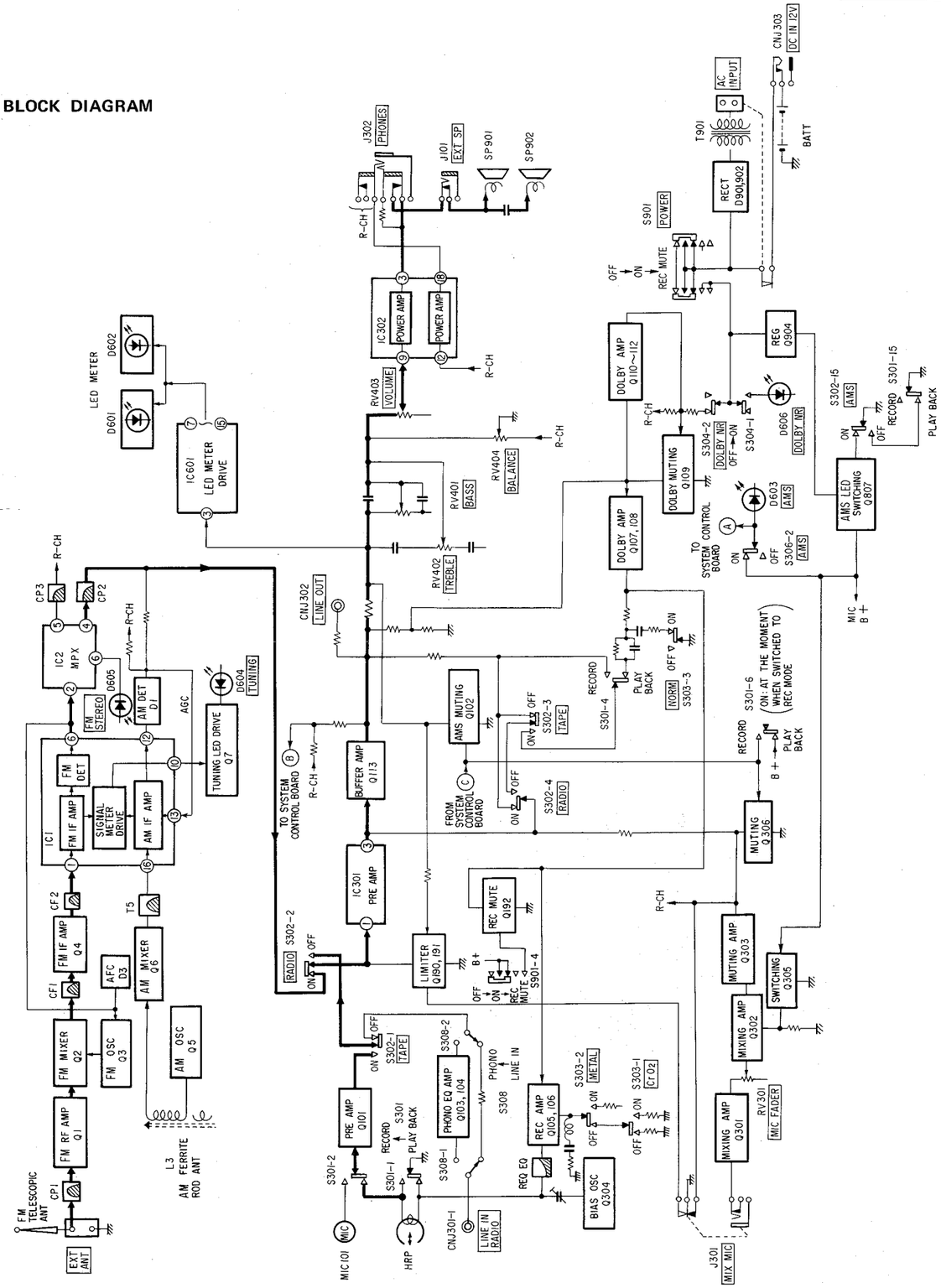
The cam gear, coupled with a magnet, contacts with the drive shaft first and turns further being driven by the drive shaft. Then, the drive arm pushes the mode slider and the mode changes.

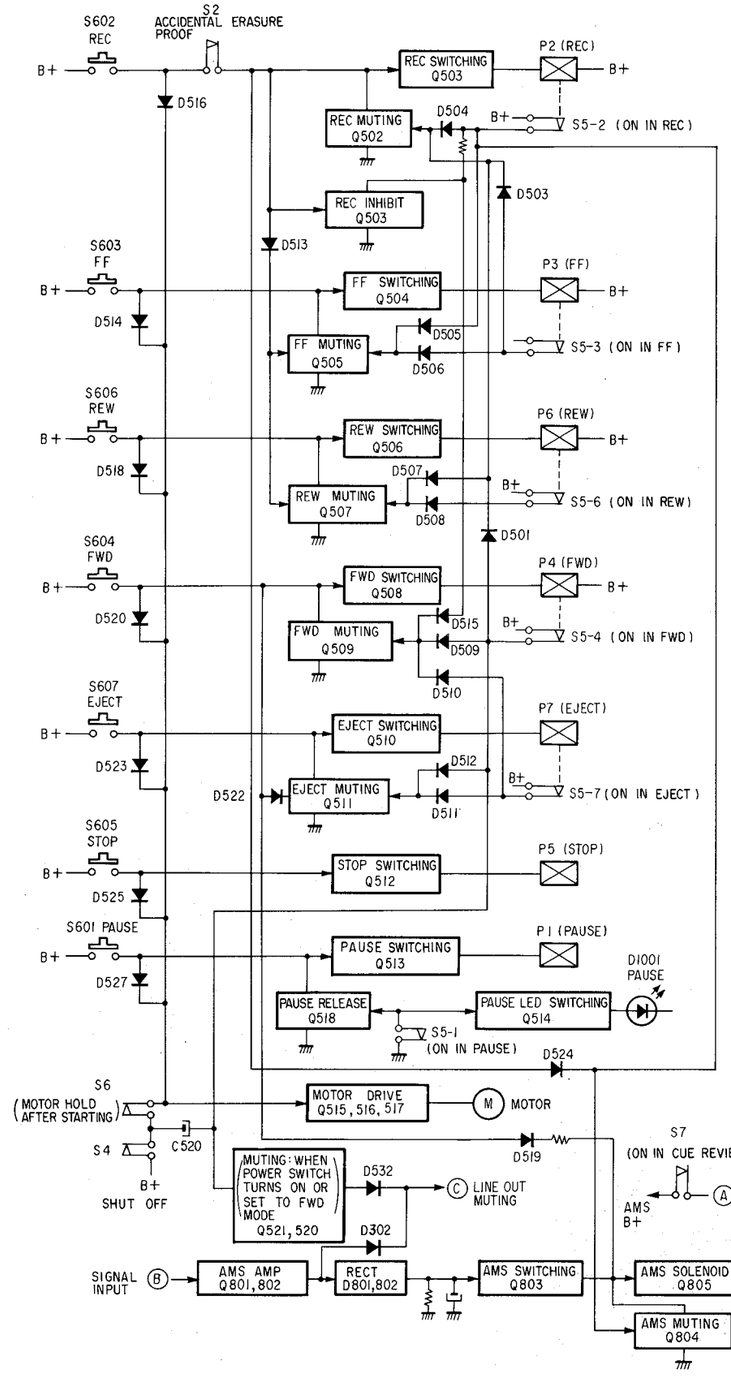


4. After currents flow in the coil (2).

When the cam gear turns 3/4 turns, the cam gear and the drive shaft come off. With the arm return spring, the cam gear returns to the initial position.

BLOCK DIAGRAM





SECTION 2
DISASSEMBLY

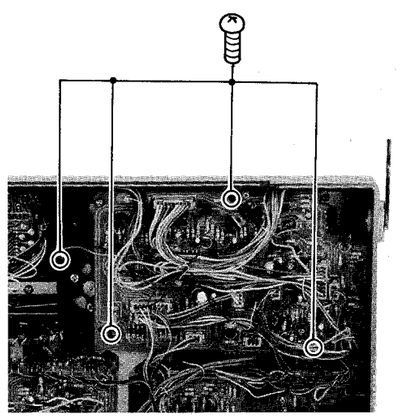
REAR CASE REMOVAL
Remove eight screws.

POWER SUPPLY BOARD REMOVAL
Remove four screws and the wire binder.

METER BOARD REMOVAL
Remove three screws and two claws.

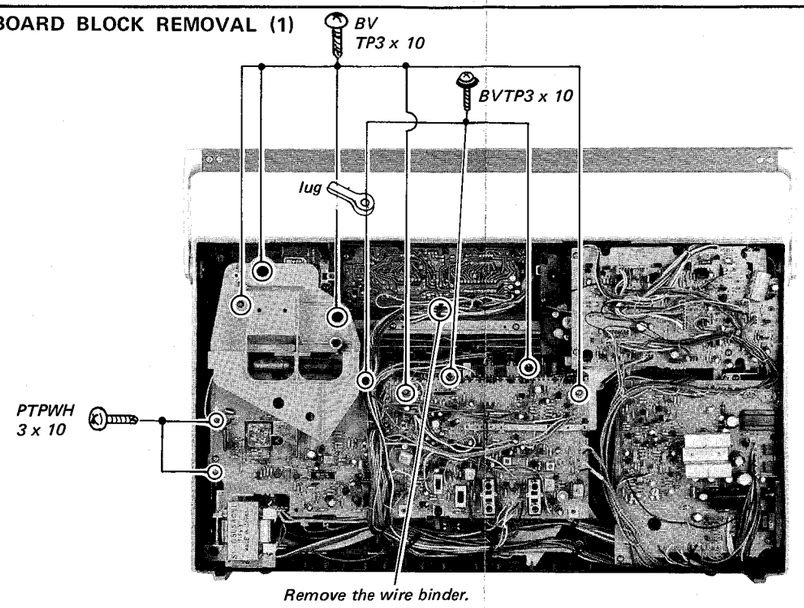
SYSTEM CONTROL BOARD REMOVAL
Remove three screws and the wire binder.

MECHANICAL BLOCK REMOVAL
Remove four screws and open the cassette lid.

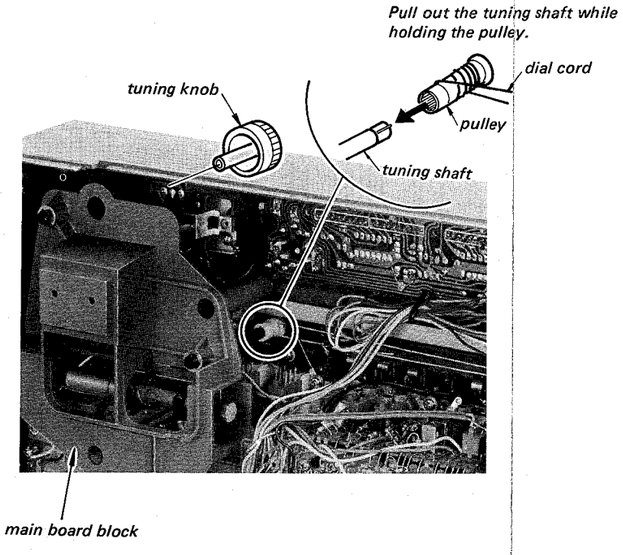


Remove the power switch board.

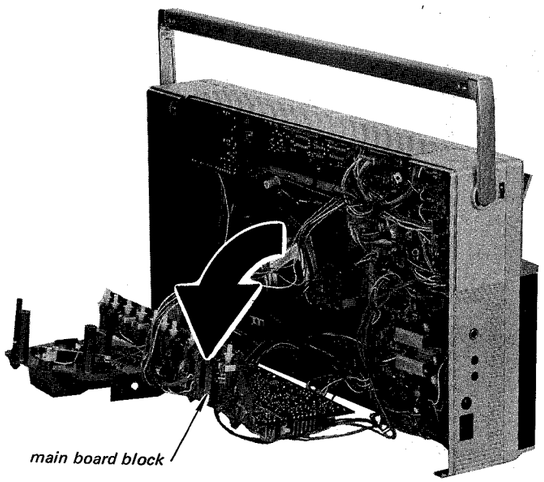
MAIN BOARD BLOCK REMOVAL (1)



MAIN BOARD BLOCK REMOVAL (2)



MAIN BOARD BLOCK REMOVAL (3)



CONTROL BOARD (1), (2) REMOVAL
Remove four screws and four knobs.

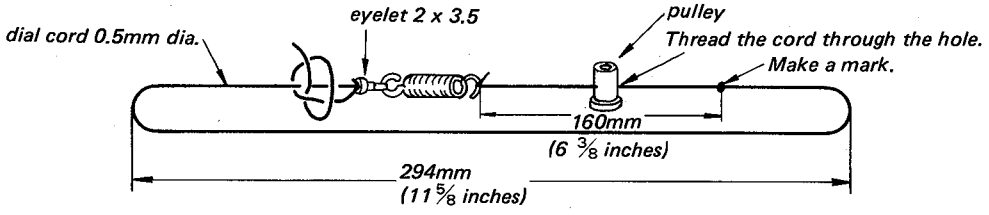
CORD STRINGING OF DIAL POINTER

CORD STRINGING OF DIAL DRUM

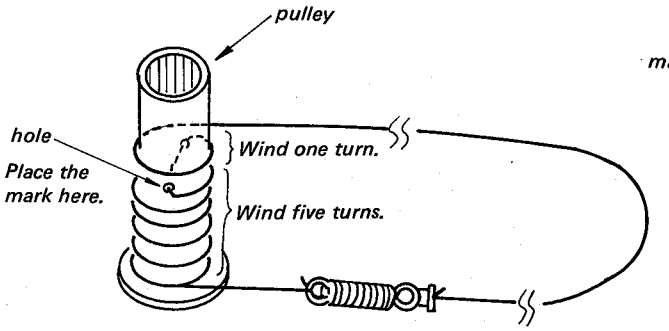
LIMITER BOARD REMOVAL
Remove two screws.

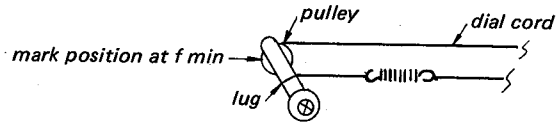
CORD STRINGING OF DIAL POINTER

1. Dial Cord Preparation



2. Dial Cord Stringing



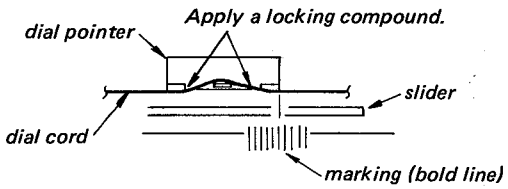


A. *Hold the pulley temporarily by bending the lug.*

B. *Erect the bent lug.*
Turn the tuning shaft counterclockwise (f min).
Insert the tuning shaft in the pulley.

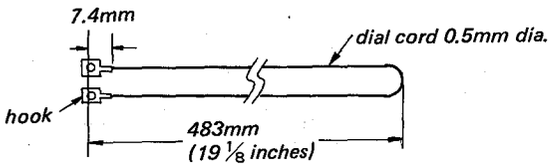
3. Dial Pointer Setting

Place the dial pointer and match its right edge on the bold line.



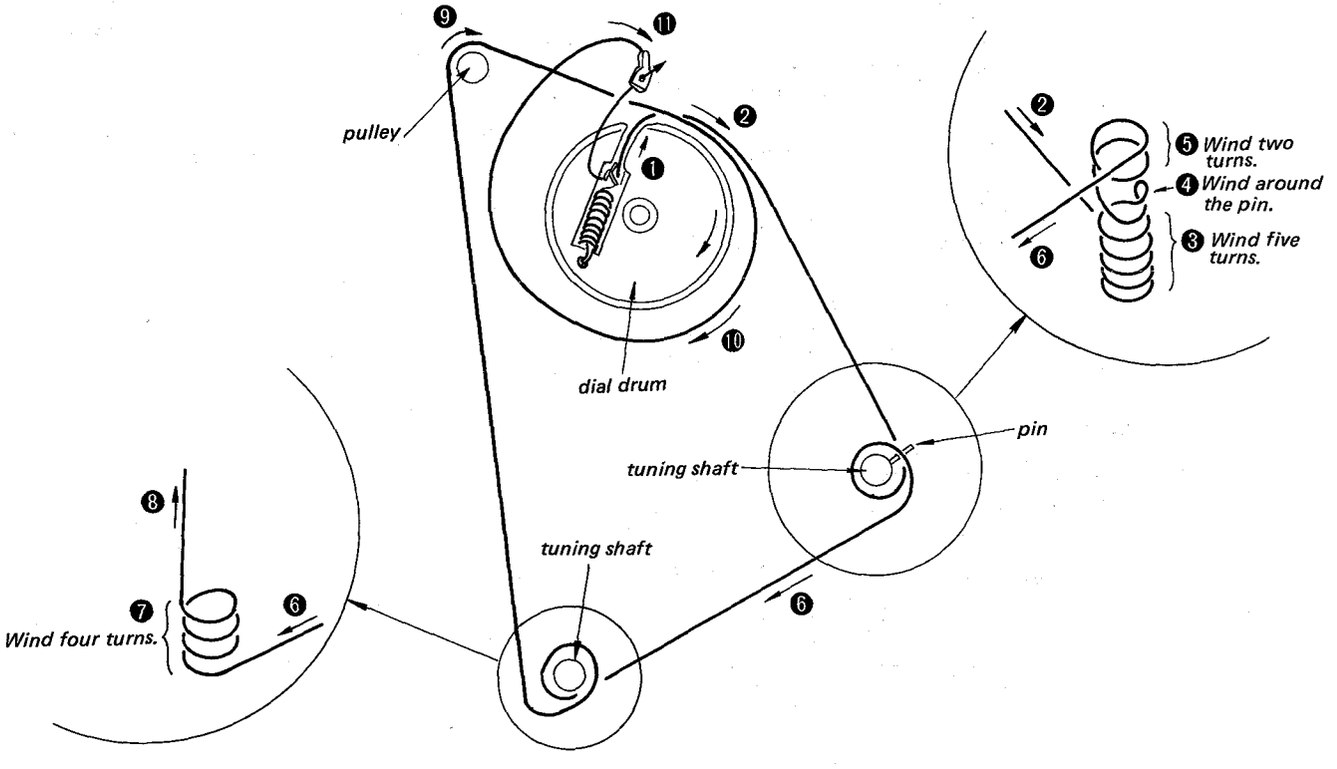
CORD STRINGING OF DIAL DRUM

1. Dial Cord Preparation



2. Dial Cord Stringing

- Turn the dial drum fully clockwise.
- Proceed in the numerical order given.



SECTION 3
ADJUSTMENTS

3-1. MECHANICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab:

record/playback head	pinch roller
erase head	rubber belts
capstan	idlers

2. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply a suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

Tape Transport Mechanism Type	MDS-80S1	
	Specification	Test Equipment
Forward Torque	25–50 g·cm (0.34–0.69 oz·inch)	Sony torque meter CQ-102C
Fast Forward And Rewind Torque	70–115 g·cm (0.98–1.59 oz·inch)	Sony torque meter CQ-201B
Back Tension Torque	2.5–5 g·cm (0.03–0.07 oz·inch)	Sony torque meter CQ-102C
Tape Pulling Force	More than 160 g (5.64 oz)	Sony tape tension meter CQ-403

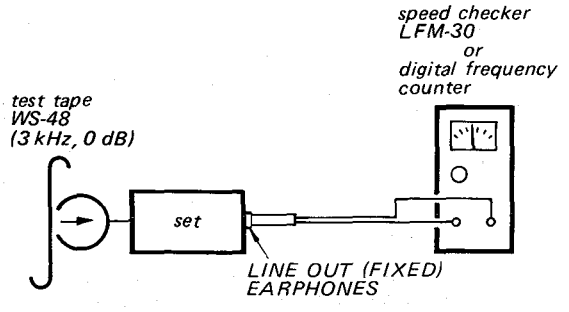
Tape Speed Adjustment

Setting:

Supply 12V dc to the DC IN jack.

Procedure:

Mode: playback

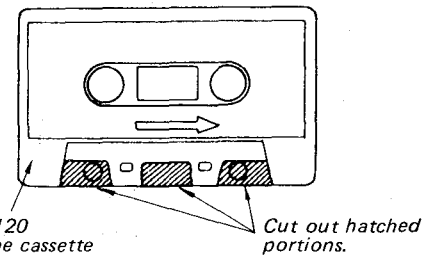


Specification:

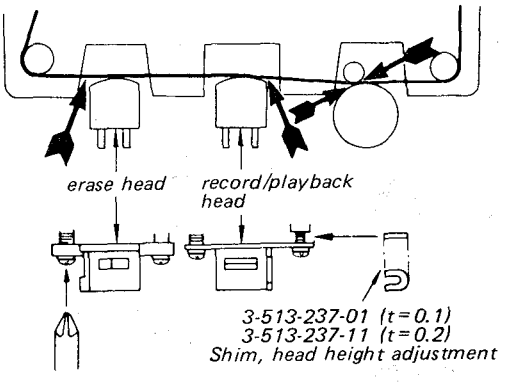
Speed checker	Digital frequency counter
−2.5 to +3 %	2925 to 3090 Hz

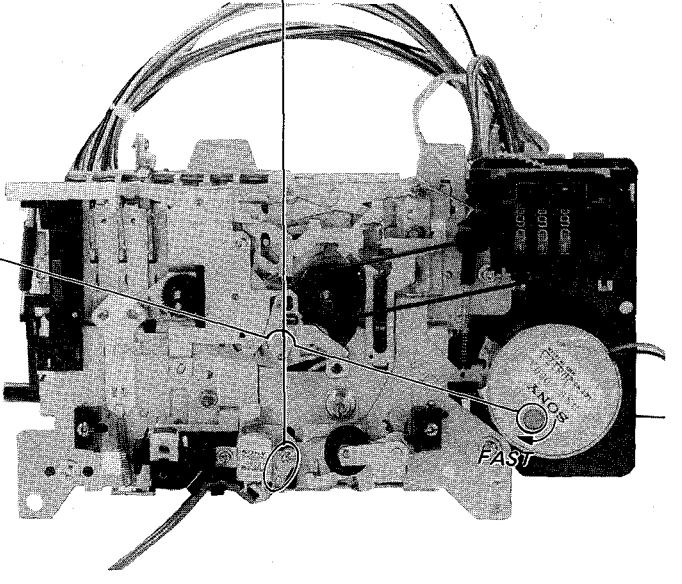
Head Height Adjustment

1. Prepare an adjustment cassette as shown below.

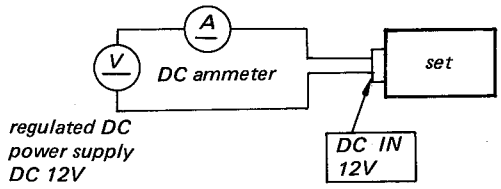


2. In record mode and viewing from the front, adjust the head heights to eliminate tape curl and tape twist at arrowed portions.

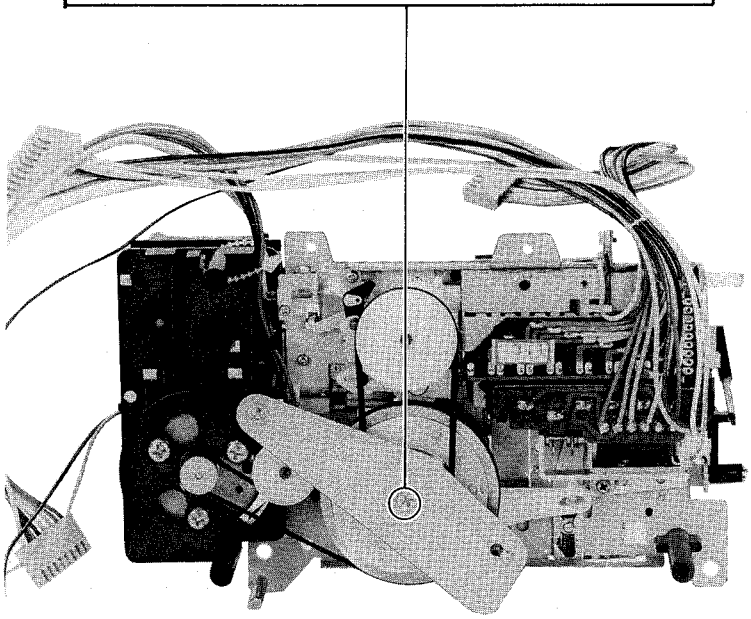




Flywheel Thrust Play Adjustment



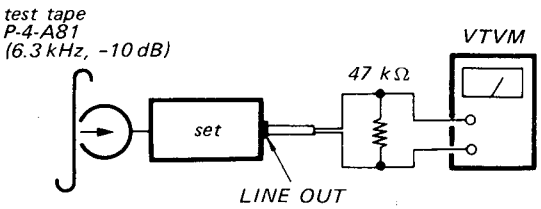
1. Loosen the thrust screw enough.
2. Tighten the thrust screw gradually and hold it just when the current suddenly increases, then turn the thrust screw ¼ turn counterclockwise.
3. Lock the screw with suitable locking compound.



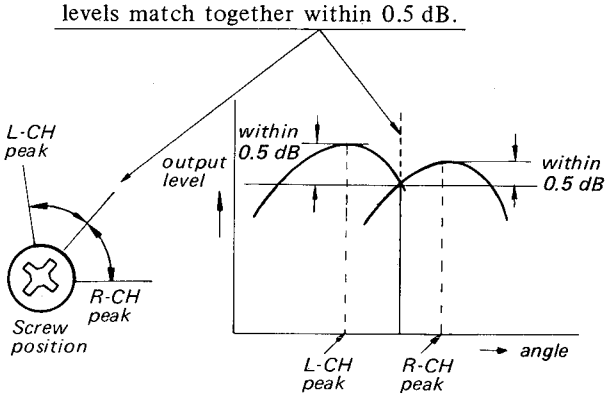
Record/playback Head Azimuth Adjustment

Procedure:

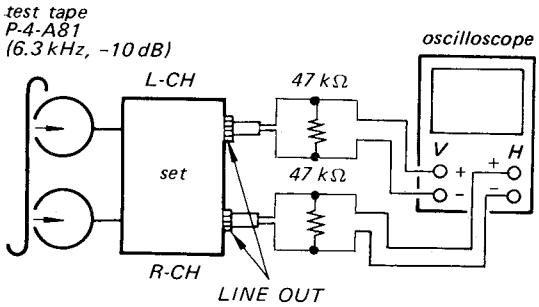
1. Mode: playback

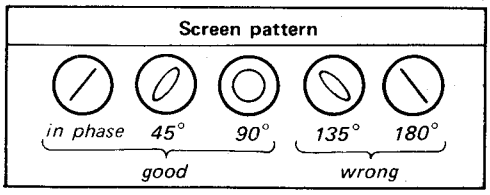


2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 0.5 dB.

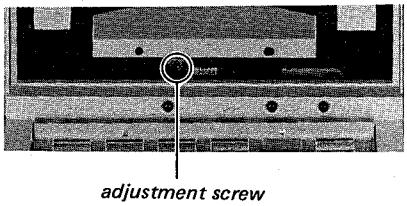


3. Phase Check
   Mode: playback





Adjustment Location:



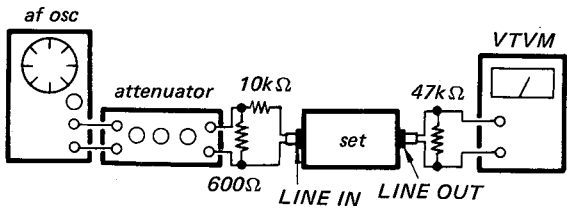
3-2. ELECTRICAL ADJUSTMENTS

Level Meter Calibration

Setting:

FUNCTION switch:	LINE IN
LINE IN/PHONO switch:	LINE IN

Procedure:



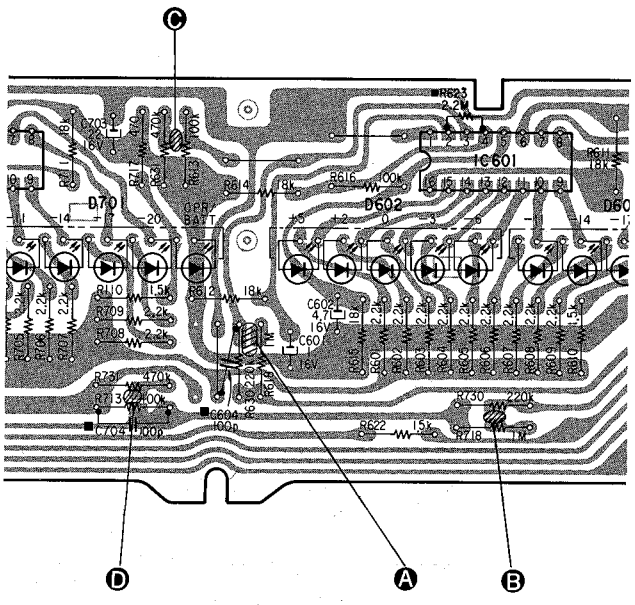
Apply 1kHz signal (−5dB, 0.44V) to LINE IN and make sure that the LED of 0dB lights up.

Adjustment Location: meter board

Change the pattern connection so that the LED of +2dB lights up or blinks when 1kHz signal (−3dB, 0.55V) is applied to LINE IN.

For the LED lighting up: Solder the patterns Ⓐ, Ⓑ

For the LED going out: Solder the patterns Ⓒ, Ⓓ



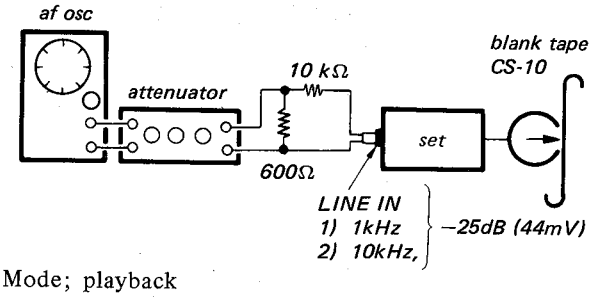
Record Bias Adjustment

Setting:

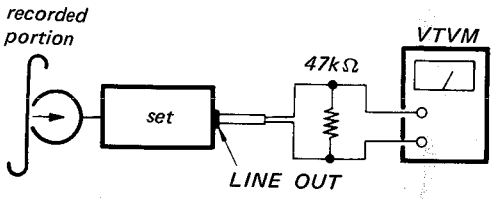
LINE IN/PHONO switch:	LINE IN
FUNCTION switch:	LINE IN
TAPE SELECT switch:	EQ . . . NORMAL TYPE I BIAS . . . TYPE I, II
DOLBY switch:	ON

Procedure:

1. Mode: record

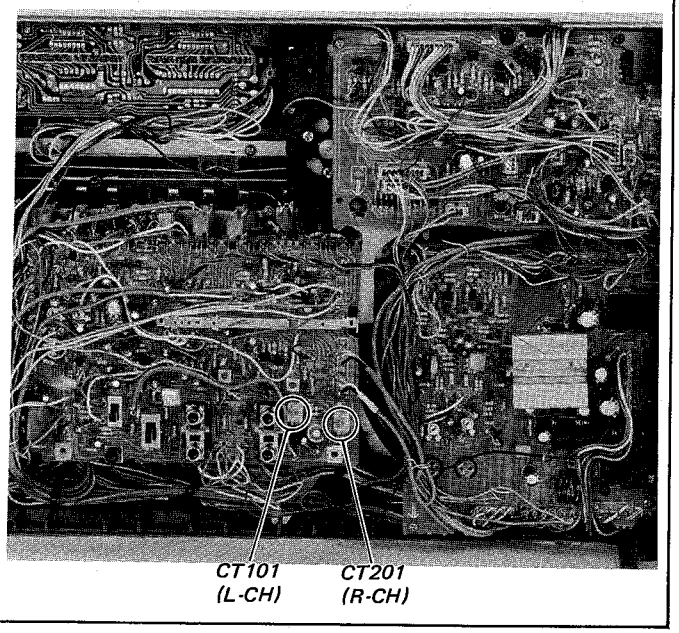


2. Mode; playback



3. Playback the recorded portion of the tape and check that the level difference between 1kHz signal and 10kHz signal is 0dB to −7dB.
   If not, adjust CT101 and CT201 and repeat step 1 to 3.

Adjustment Location: power board

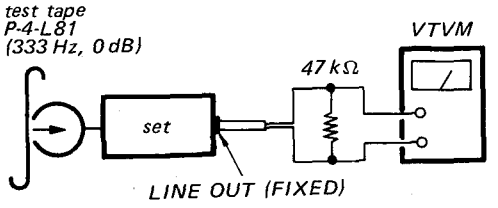


Playback Level Adjustment

Setting:

EQ switch:	NORMAL
DOLBY siwtch:	OFF

Procedure:



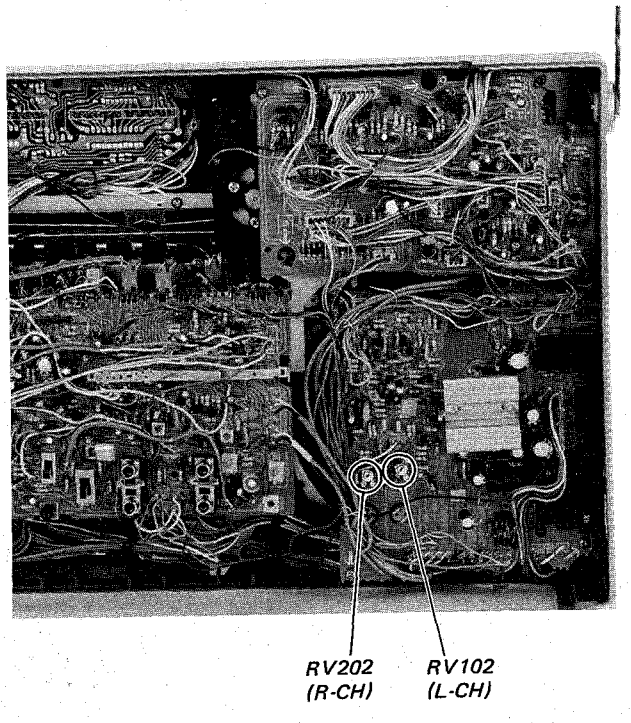
Specification:

LINE OUT level: −2 dB
(0.62 V)

Level difference between channels:
less than 0.5 dB

Check that the LINE OUT level does not change in playback mode while changing the mode from playback to stop several times.

Adjustment Location:



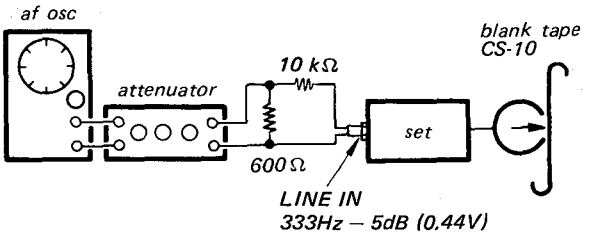
Record Level Adjustment

Setting:

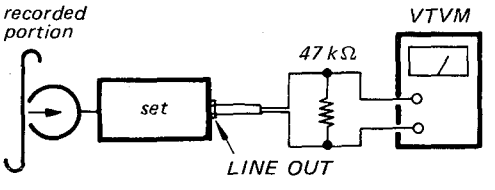
FUNCTION switch:	LINE IN
LINE IN/PHONO switch:	LINE IN
TAPE SELECT switch:	EQ . . . NORMAL TYPE I
	BIAS . . . TYPE I, II

Procedure:

1. Mode: record



2. Mode: playback



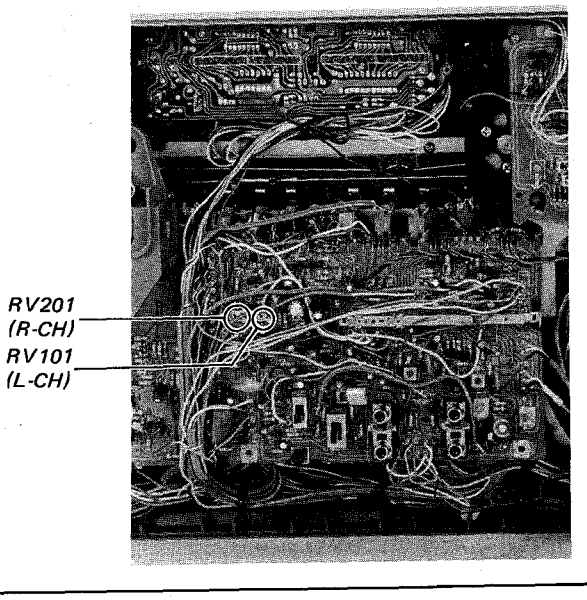
Playback the recorded tape and measure the LINE OUT level.

Adjust RV101/RV201 to obtain the specification and repeat the step 1 and 2.

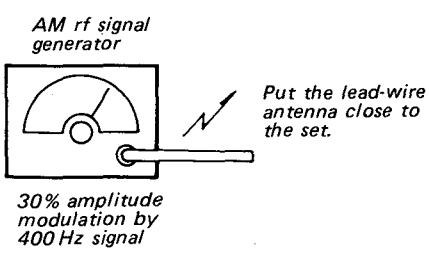
Specification:

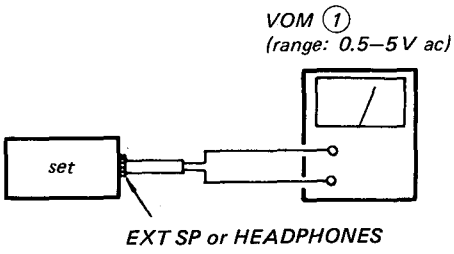
−4 dB ± 0.5 dB

Adjustment Location: main board



AM SECTION

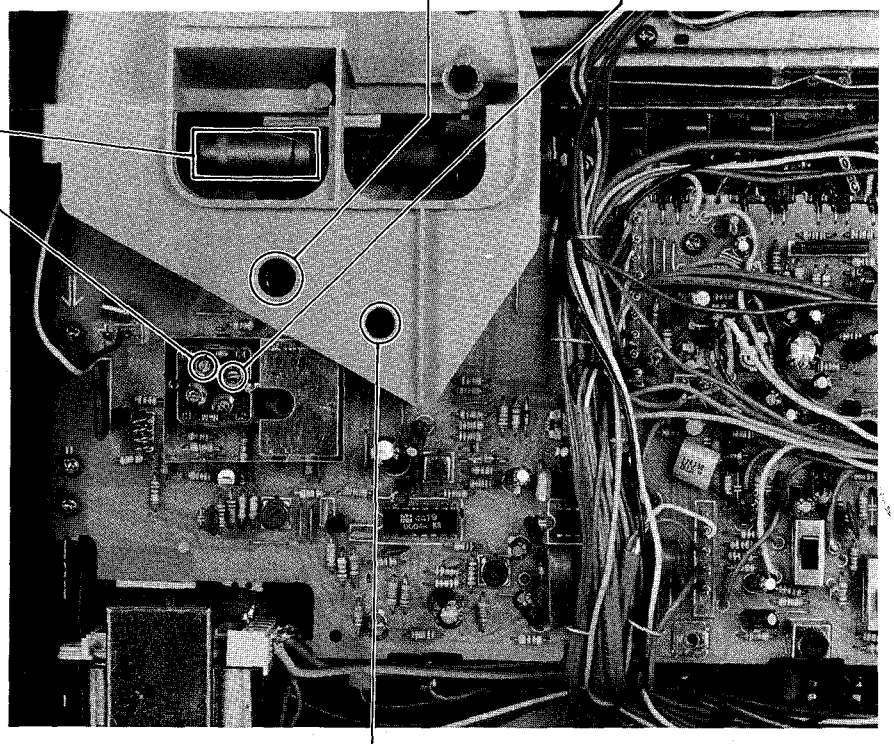




- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

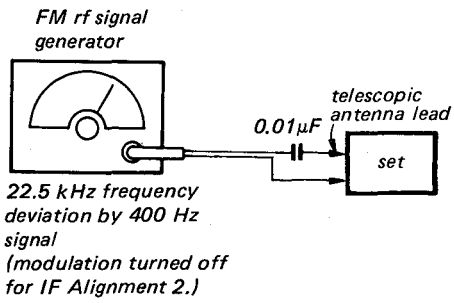
AM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VOM (1).	
520kHz	1,680kHz
T4	CT3

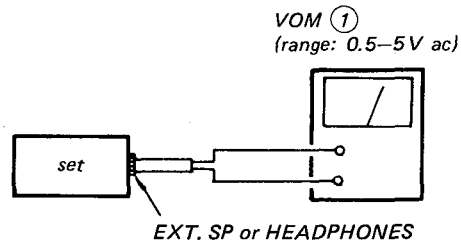
AM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM (1).	
620kHz	L3
1,400kHz	CT4



T5
455kHz
Adjust for a maximum reading on VOM (1).
AM IF ALIGNMENT

FM SECTION

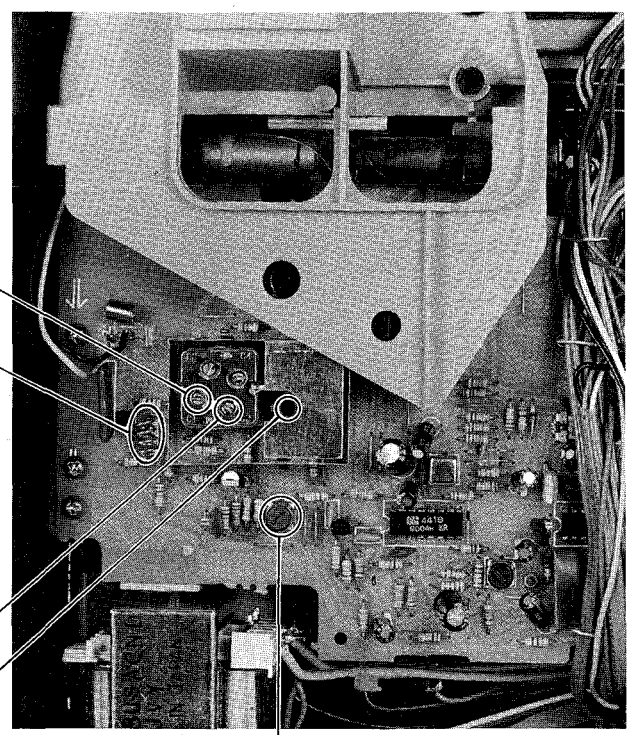

FM rf signal generator
telescopic antenna lead
0.01μF
set
22.5 kHz frequency deviation by 400 Hz signal (modulation turned off for IF Alignment 2.)



- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

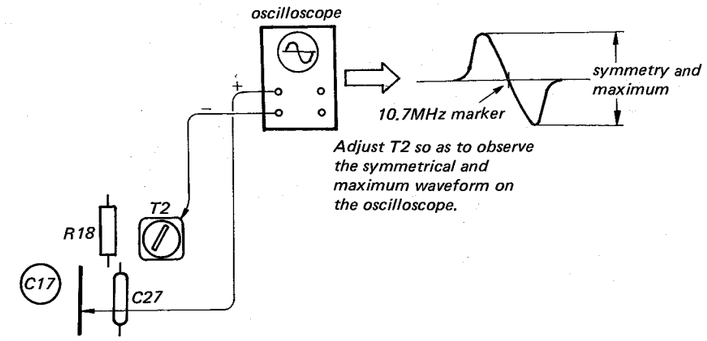
FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
87.1MHz	108.5MHz
L1	CT1

FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
108.5MHz	CT2
87.5MHz	L2

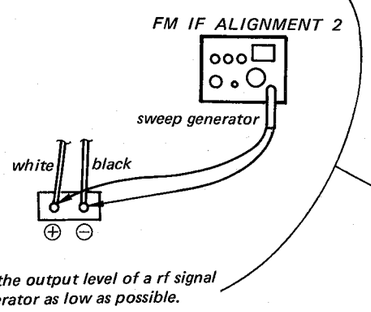


T1
Adjust for a maximum reading on VOM ①.
FM IF ALIGNMENT 1 (10.7MHz with modulation)

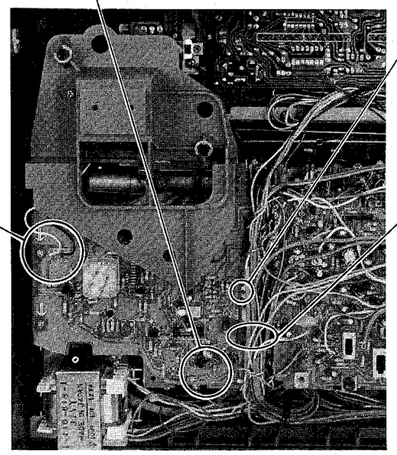
FM IF ALIGNMENT 2
No Modulation 10.7MHz



Adjust T2 so as to observe the symmetrical and maximum waveform on the oscilloscope.



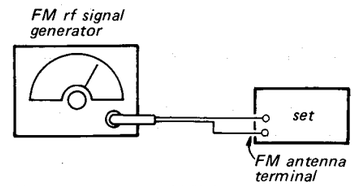
Set the output level of a rf signal generator as low as possible.



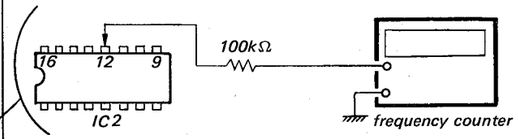
19 kHz Adjustment

A) Regular Method

Procedure:



Carrier frequency: 98MHz
Modulation: 1kHz, 22.5kHz deviation
Output level: 563μ (55dB)

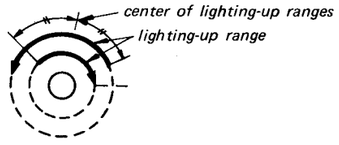


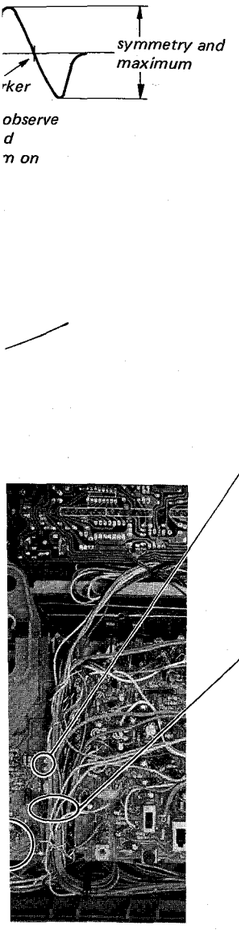
1. Tune the set to 98 MHz.
2. Adjust RV1 for 19 kHz ±30 Hz on the counter.

B) Simple Method

Procedure:

1. Tune the set to the FM stereo broadcasting signal.
2. Turn RV1 clockwise or counterclockwise and memorize the lighting-up range of the stereo lamp.
3. Secure RV1 at the center of the lighting-up range of both turns as shown below.

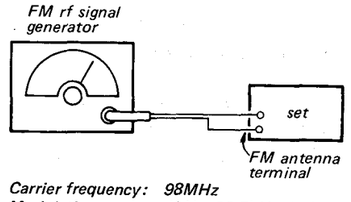




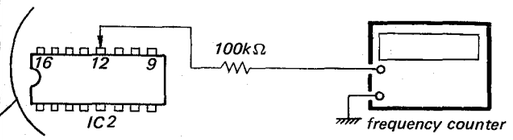
19 kHz Adjustment

A) Regular Method

Procedure:



Carrier frequency: *98MHz*
Modulation: *1kHz, 22.5kHz deviation*
Output level: *563μ (55dB)*

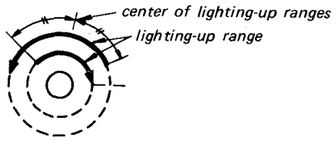


1. Tune the set to 98 MHz.
2. Adjust RV1 for 19 kHz ±30 Hz on the counter.

B) Simple Method

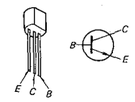
Procedure:

1. Tune the set to the FM stereo broadcasting signal.
2. Turn RV1 clockwise or counterclockwise and memorize the lighting-up range of the stereo lamp.
3. Secure RV1 at the center of the lighting-up range of both turns as shown below.

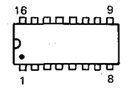


Replacement Semiconductors

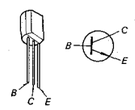
2SC930
2SC1364
2SC1362



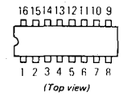
KB4419
LA3361



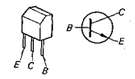
2SC710-13
2SC710-14



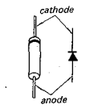
LB1409



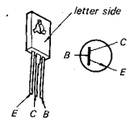
2SD773



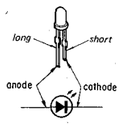
1T22AM
1S1555
RD3.0E
RD6.2E
RD9.1E



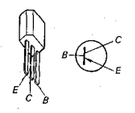
2SD998



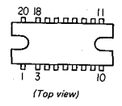
SLP231B
SLP131B



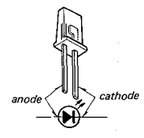
2SA1027R



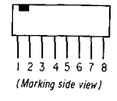
LA4125T



SLP141B
SLP241B
SLP341B



BA328



CIRCUIT DESCRIPTION

See page 20.

FWD

1. When the FWD button (S604) is pressed, via S604 and R525, B+ turns on Q508.
2. Currents flow in the FWD solenoid (P4) so that the mode selection mechanism is activated.
3. The FWD switch S5-4 turns on mechanically.
4. Via D509 and R527, B+ turns on Q509 so that the FWD button is inhibited.
5. Via D501 and R532, B+ turns on Q502 so that the REC button is inhibited. Likewise via D512 and R542, B+ turns on Q511 and the EJECT button is inhibited.
6. Via S5-4, D542, R510, D532 and D301, B+ turns on Q102 that mutes the starting noise. After that, the muting stops since Q520 turns on and Q519 turns off.
   When the power switch turns on, via C520, R510, D532 and D301, B+ turns on Q102 that mutes the switching noise.
7. With the aid of the motor torque, the mode selection mechanism works. So the motor has to start initially to trigger the mechanism when the mode button is pressed.
   When the FWD button is pressed, via D520, D517, R515 and R514, B+ turns on Q515 and Q516. Then the motor starts.
   After starting, the motor-hold switch (S6) is turned on mechanically and the motor keeps rotating.

FF

1. When the FF button (S603) is pressed, B+ turns on Q504 via S603 and R537.
2. Currents flow in the FF solenoid (P3) that activates the mode selection mechanism.
3. The FWD switch S5-3 turns on mechanically.
4. Via S5-3, D506 and R538, B+ turns on Q505 so that the FF button is inhibited.
5. Via S5-3, D503 and R532, B+ turns on Q502 so that the REC button is inhibited.
6. Via S603, D514, D517 and R515, B+ turns on Q515 so that the motor rotates. Therefore, the starting of the motor is done instantly by pressing the FF button.

REW

The same manner as mentioned in FF.

REC

1. Press the FWD button while pressing the REC button. (Otherwise the REC button is inhibited.)
2. Via S602, S2 and R531, B+ turns on Q501.
3. Currents flow in the REC solenoid (P2) and S5-2 turns on.
4. Via S5-2, D504 and R532, B+ turns on Q502 so that the REC button is inhibited.
   Via S5-2, D505 and R538, B+ turns on Q505 so that the FF button is inhibited.
   Via S5-2, D507 and R536, B+ turns on Q507 so that the REW button is inhibited.
   Via S5-2 and D515, B+ turns on Q509 so that the FWD button is also inhibited.
5. When keep on pressing the REC button, B+ via S602, S2 and R502 turns on Q503. Thus B+ via S5-2 is shunted through Q503 so that Q509 turns off and the FWD button is not inhibited. Consequently the REC-FWD mode is set.

STOP

When the STOP button is pressed, C508 charges and Q512 is ON until the gear of the mode selection mechanism contacts.

PAUSE

When the PAUSE button is pressed, C505 charges and Q513 is ON until the gear of the mode selection mechanism contacts.
The ON/OFF of the PAUSE is locked mechanically. S5-1 is ON when the PAUSE is ON mechanically. In PAUSE mode, turn off the POWER switch and turn it off again, via Ⓖ , C502, Q518 and R517 Q512 turns on and the PAUSE mode is released.

Button Inhibition

During the mode selection mechanism is working, buttons are inhibited.

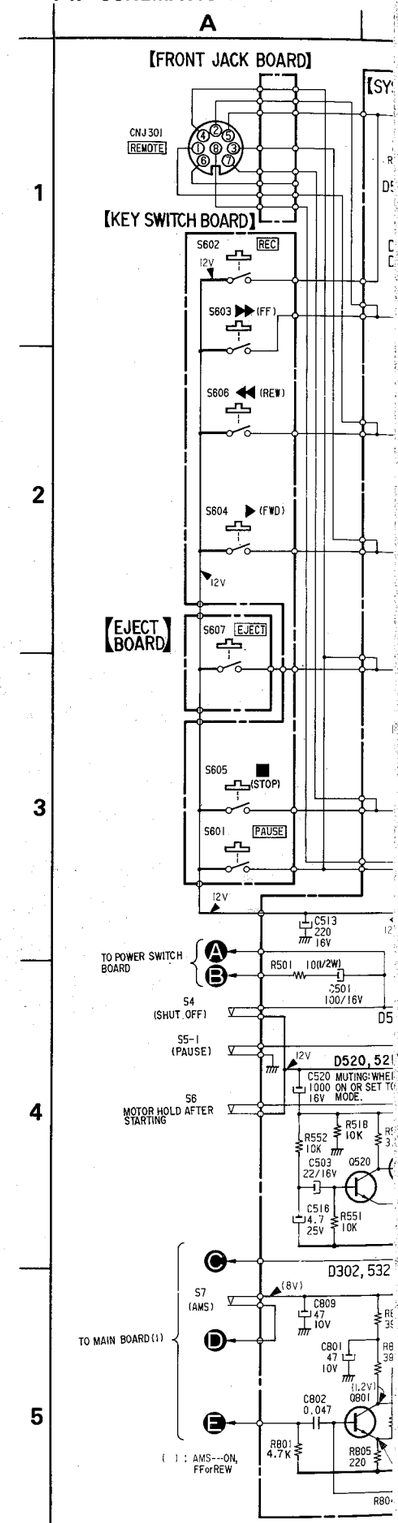
1. When the FF button is pressed, C512 charges through D514 instantly.
2. Then, C512 discharges through R533 and Q502 is ON so that the REC button is inhibited.
3. After the mode changed to FF, via S5-3, D503 and R532, Q502 turns on and the REC button is still inhibited.

Automatic Music Sensor

Depress the AMS switch (ON) and set to the Fast Forward mode or the Rewind mode.
The AMS searches for the blank space between selections.

1. Q801 and Q802 amplify signals from Ⓔ up to a clip-level.
2. D801 and D802 rectify and C806 charges.
3. When C806 charges up, Q803 and Q805 are ON. Then the AMS selenoid (P8) energizes and releases the FF button or the REW button.
4. Muting:
   S7 is ON in the FF or the REW mode and B+ is supplied to the AMS circuit.
   Via D302, Ⓒ and D301, Q102 turns on and mutes.
5. In the REC mode:
   At the moment when the REC button is pressed, via D524 and R543 Q804 turns on and Q805 is muted.
   Then via S5-2 and R544, Q804 is ON and Q805 is muted.
6. When the FWD button is pressed in the AMS mode, via D519, R812 and R817 Q805 turns on and the AMS solenoid energizes so that the FF button or the REW button is released.

4-1. SCHEMATIC DIAGRAM



REC

1. Press the FWD button while pressing the REC button. (Otherwise the REC button is inhibited.)
2. Via S602, S2 and R531, B+ turns on Q501.
3. Currents flow in the REC solenoid (P2) and S5-2 turns on.
4. Via S5-2, D504 and R532, B+ turns on Q502 so that the REC button is inhibited.
   Via S5-2, D505 and R538, B+ turns on Q505 so that the FF button is inhibited.
   Via S5-2, D507 and R536, B+ turns on Q507 so that the REW button is inhibited.
   Via S5-2 and D515, B+ turns on Q509 so that the FWD button is also inhibited.
5. When keep on pressing the REC button, B+ via S602, S2 and R502 turns on Q503. Thus B+ via S5-2 is shunted through Q503 so that Q509 turns off and the FWD button is not inhibited. Consequently the REC-FWD mode is set.

STOP

When the STOP button is pressed, C508 charges and Q512 is ON until the gear of the mode selection mechanism contacts.

PAUSE

When the PAUSE button is pressed, C505 charges and Q513 is ON until the gear of the mode selection mechanism contacts.
The ON/OFF of the PAUSE is locked mechanically. S5-1 is ON when the PAUSE is ON mechanically. In PAUSE mode, turn off the POWER switch and turn it off again, via Ⓖ , C502, Q518 and R517 Q512 turns on and the PAUSE mode is released.

Button Inhibition

During the mode selection mechanism is working, buttons are inhibited.

1. When the FF button is pressed, C512 charges through D514 instantly.
2. Then, C512 discharges through R533 and Q502 is ON so that the REC button is inhibited.
3. After the mode changed to FF, via S5-3, D503 and R532, Q502 turns on and the REC button is still inhibited.

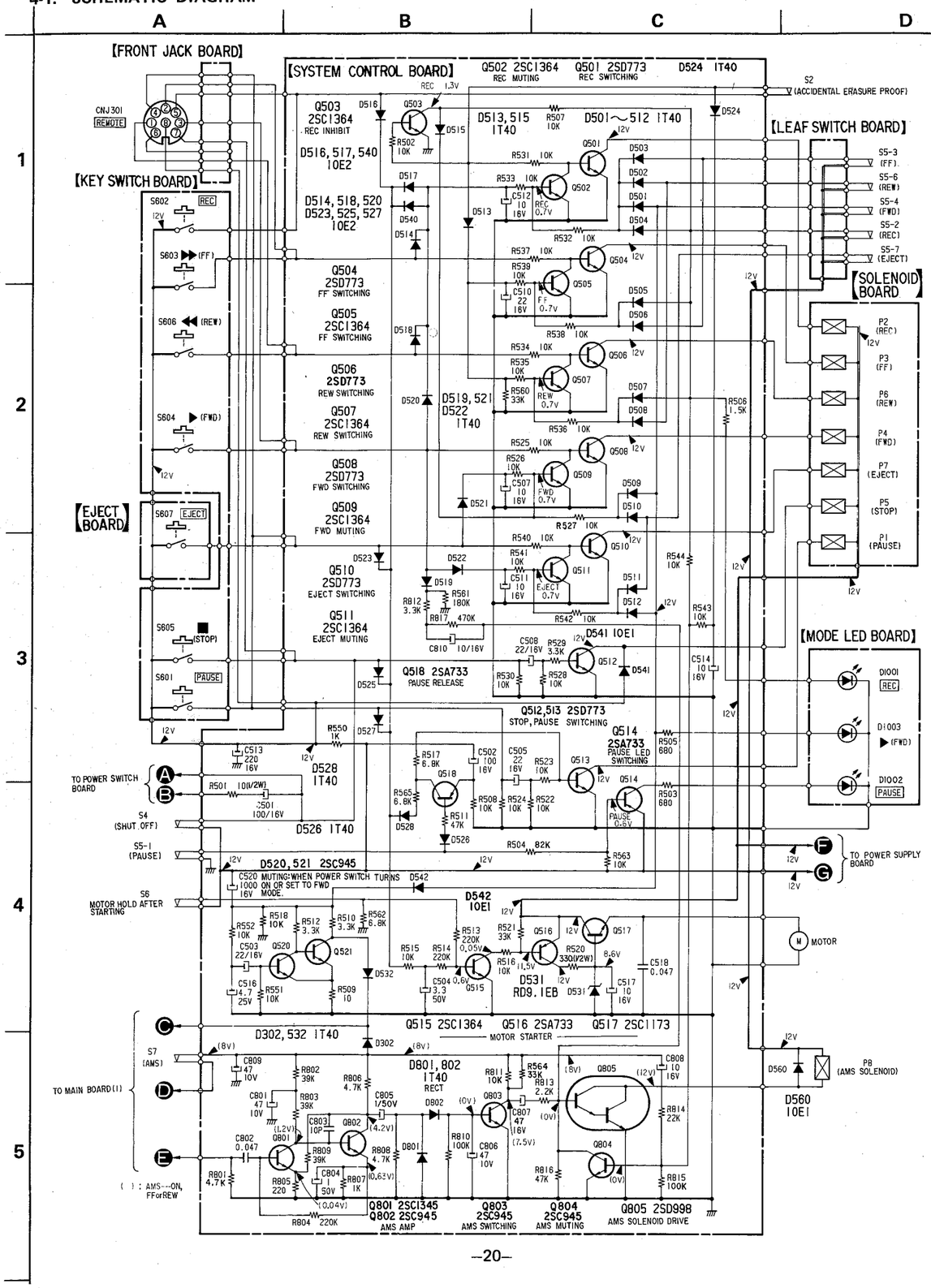
Automatic Music Sensor

Depress the AMS switch (ON) and set to the Fast Forward mode or the Rewind mode.
The AMS searches for the blank space between selections.

1. Q801 and Q802 amplify signals from Ⓔ up to a clip-level.
2. D801 and D802 rectify and C806 charges.
3. When C806 charges up, Q803 and Q805 are ON. Then the AMS selenoid (P8) energizes and releases the FF button or the REW button.
4. Muting:
   S7 is ON in the FF or the REW mode and B+ is supplied to the AMS circuit.
   Via D302, Ⓒ and D301, Q102 turns on and mutes.
5. In the REC mode:
   At the moment when the REC button is pressed, via D524 and R543 Q804 turns on and Q805 is muted.
   Then via S5-2 and R544, Q804 is ON and Q805 is muted.
6. When the FWD button is pressed in the AMS mode, via D519, R812 and R817 Q805 turns on and the AMS solenoid energizes so that the FF button or the REW button is released.

CFS-F5

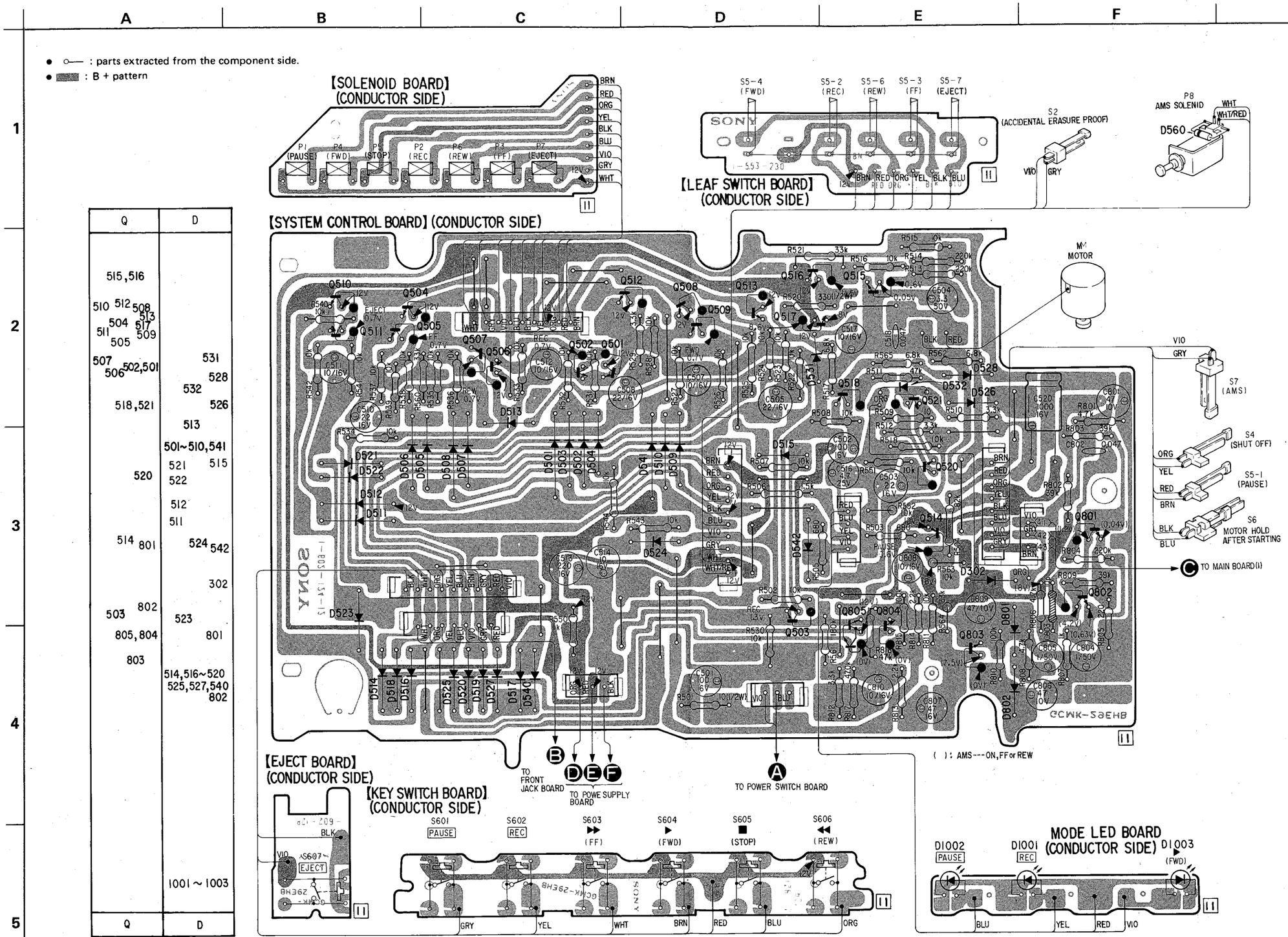
4-1. SCHEMATIC DIAGRAM



4-2. MOUNTING DIAGRAM

– Conponent Side –

- ○— : parts extracted from the component side.
- ▬ : B + pattern



Q	D
515,516	
510 512 508 513 504 517 511 509 505	
507 506 502,501	531 528 532
518,521	526 513
	501~510,541 521 515 522
520	512 511
514 801	524 542 302
503 802	523
805,804	801
803	514,516~520 525,527,540 802
	1001 ~ 1003
Q	D

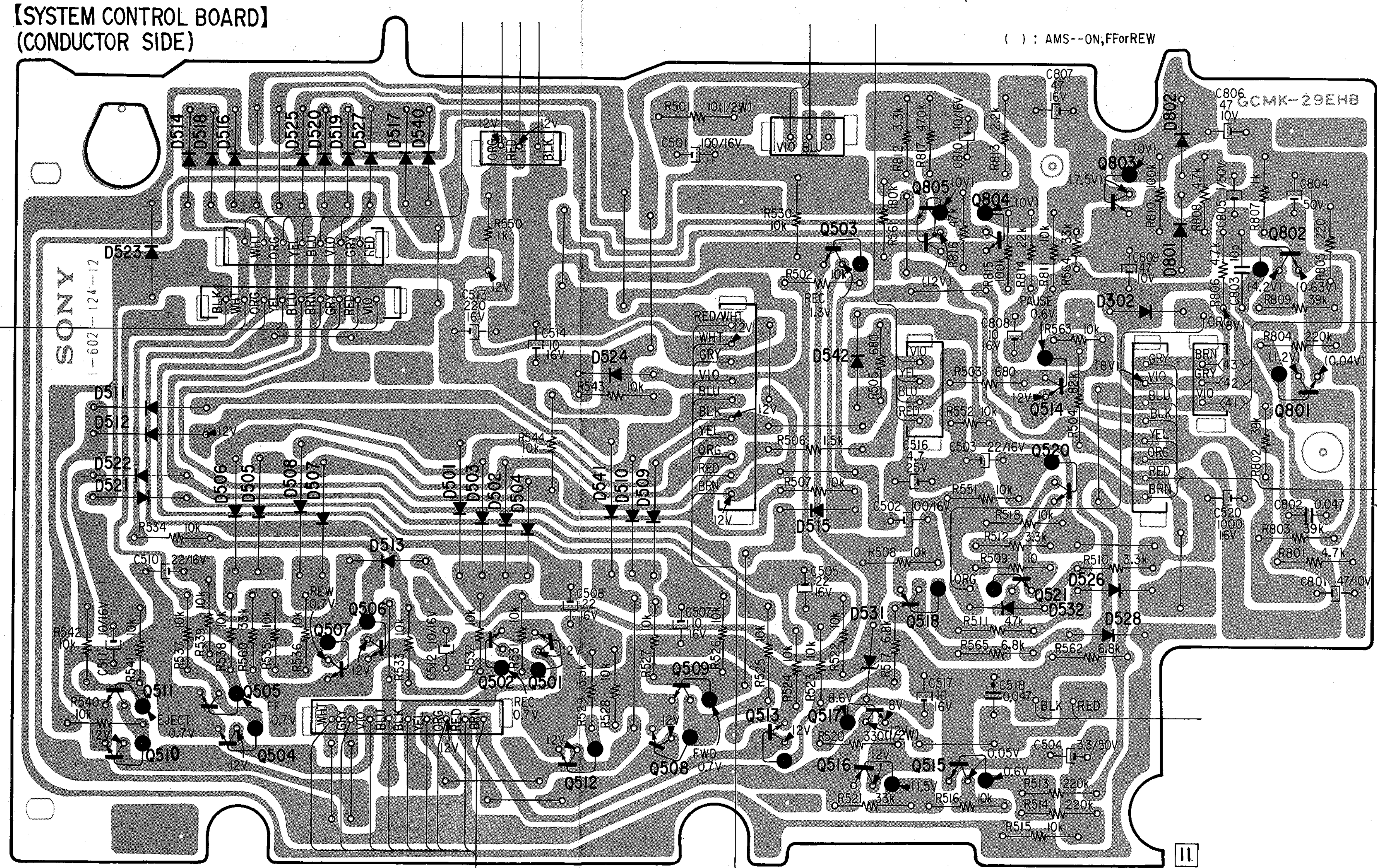
4-3. MOUNTING DIAGRAM

– Conductor Side –

	A	B	C	D	E	F
Q	511, 510	505, 504, 507, 506	502,501, 512, 509, 508	513, 503, 517, 516, 518, 805, 804, 515	521, 514, 520, 803	802, 801
D		523, 511, 512, 522, 521, 514, 516~520, 525, 505~508, 527, 540, 513	501 ~ 504, 524, 541, 510, 509	515, 542, 531	532, 302, 802, 801, 526, 528	

【SYSTEM CONTROL BOARD】
(CONDUCTOR SIDE)

( ) : AMS--ON, FF or REW

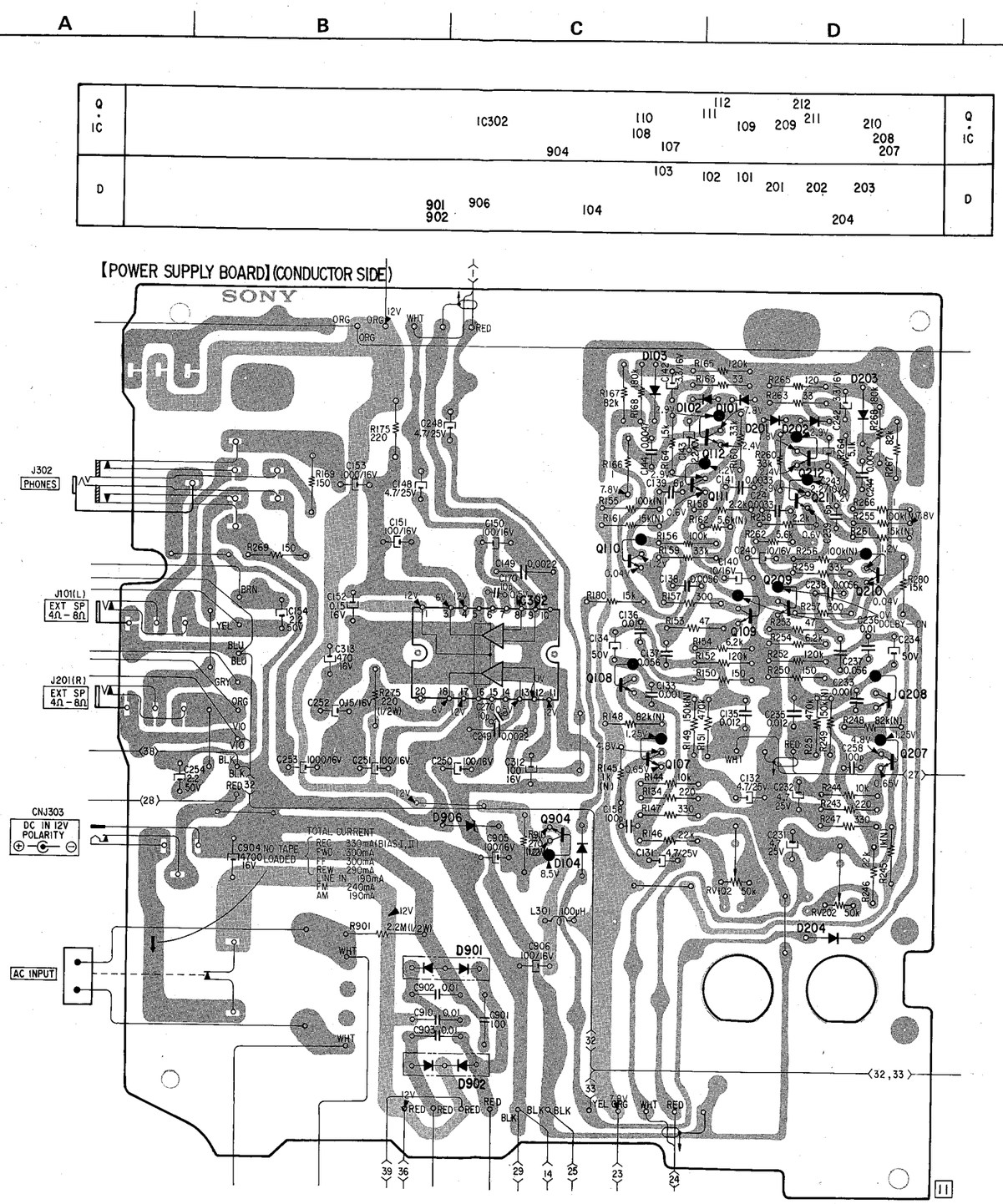

GCMK-29EHB
SONY
1-602-124-12
D514 D518 D516 D525 D520 D519 D527 D517 D540
D523 D511 D512 D522 D521
D506 D505 D508 D507 D501 D503 D502 D504 D541 D510 D509
D513 D524 D542 D515 D531 D526 D532 D528 D302 D801 D802
Q501 Q502 Q503 Q504 Q505 Q506 Q507 Q508 Q509 Q510 Q511 Q512 Q513 Q514 Q515 Q516 Q517 Q518 Q520 Q521
Q801 Q802 Q803 Q804 Q805
EJECT 0.7V
FF 0.7V
REW 0.7V
REC 0.7V
FWD 0.7V
PAUSE 0.6V
REC 1.3V
11

Note:

- ○— indicates lead wire connection through the component side.
- ▒ : B+ pattern.

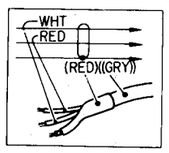
4-4. MOUNTING DIAGRAM
– Conductor Side –

【POWER SUPPLY BOARD】(CONDUCTOR SIDE)



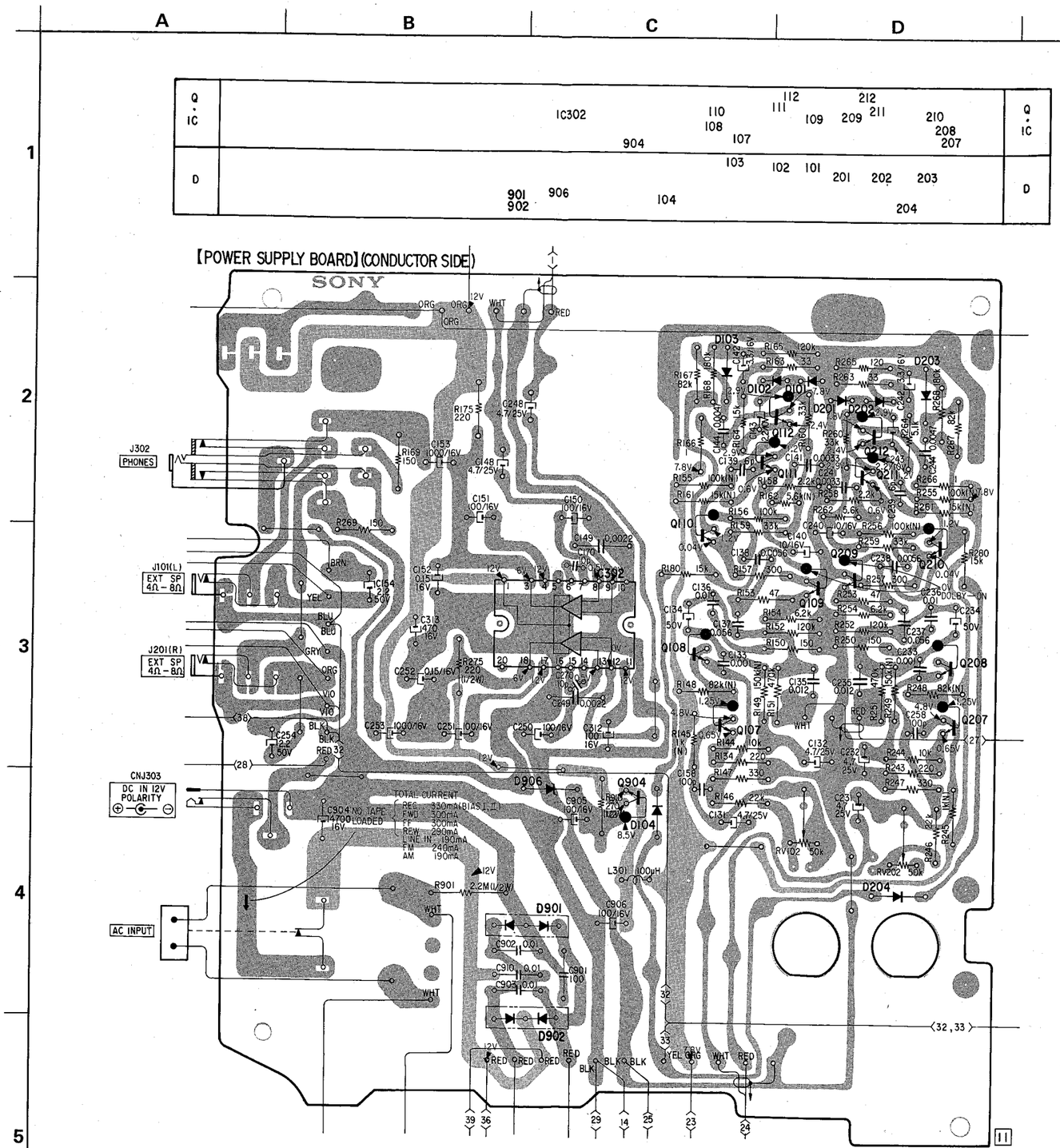
Note:

- Color code of sleeving over the end of the jacket.



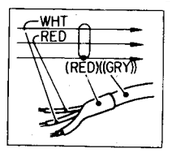
- ○— : parts extracted from the component side.
- ●— : parts extracted from the conductor side.
- ■ : part mounted on the conductor side.
- [ ]— : indicates side identified with part number.
- ▒▒ : B + pattern

4-4. MOUNTING DIAGRAM
– Conductor Side –

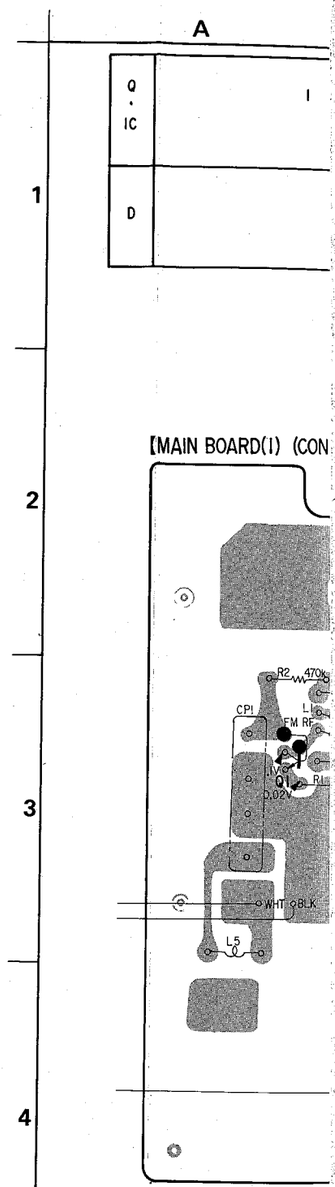


Note:

- Color code of sleeving over the end of the jacket.



- ○— : parts extracted from the component side.
- ●— : parts extracted from the conductor side.
- ■ : part mounted on the conductor side.
- [1]— : indicates side identified with part number.
- ▒▒ : B + pattern



A B C D E F G H

Q・IC

D

【MAIN BOARD(1) (CONDUCTOR SIDE)

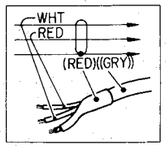
MAIN BOARD(2)
(CONDUCTOR SIDE)

4-5. MOUNTING DIAGRAM

— Component Side —

Note:

- ○—: parts extracted from the component side.
- ●—: parts extracted from the conductor side.
- ■ : part mounted on the conductor side.
- [+]— : indicates side identified with part number.
- ▒▒ : B+ pattern
- ▬▶▬ : signal path
- ▬▶▬ : L-CH signal path
- ▬▶▬ : R-CH signal path
- Color code of sleeving over the end of the jacket.



【CONTROL BOARD(2)】

【CONTROL BOARD(1)】

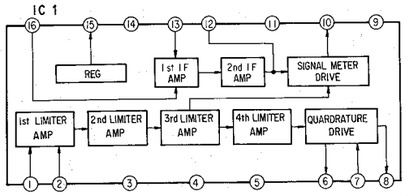
【FRONT JACK BOARD】

【METER BOARD】

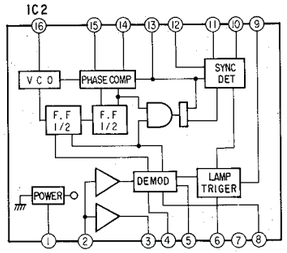
【LIMITER BOARD】

【MAIN BOARD(1)】

IC 1



IC2



Q, IC, D

IC701 IC601

D603,D606
D702,D701,D602,D601

D605,D604

Q291,Q191

D290,D190

Q290,Q291 D2

Q807

Q303

Q306

Q305

IC301 Q101

Q6 Q201

Q302

Q5

Q292 Q192
Q113,Q213

Q4

D3

Q104

Q7 Q204

D4

Q1 Q3 Q106,Q105
Q203

Q103 Q206,Q205

D1
D5

Q2

Q4 IC1, IC2

Q202,Q102

Q304

D301

Q, IC, D

IC701,601

IC301

AM SIGNAL INPUT

FM TEL ANT

EXT ANT

FM SIGNAL INPUT

CF1,2

H I J K L M N O

1 2 3 4 5

IC701,601

IC301

[POWER SWITCH BOARD]

S901 POWER

MIC101 C-1004Q (L)

MIC102 C-1004Q (R)

IC 210 212 112 211 209 109 111 110 107 108 IC302 904 207 208

D 203 202 201 204 101 102 103 104 906 902 901

[MAIN BOARD(2)]

S303 TAPE SELECT CrO2(IV) NORM(TYPE I)

S302 RADIO PHONO/LINE IN TAPE

S304 DOLBY NR

IC301

Q303 Q306 Q305 Q302 Q213 Q104 Q204 Q103 Q105 Q106 Q205 Q206 Q207 Q208 Q102 Q101 Q201 Q304 Q807

S308 LINE IN PHONO

CNJ301 LINE IN/PHONO

CNJ302 LINE OUT

D301

[POWER SUPPLY BOARD]

D103 D203 D101 D102 D201 D202 D204 D104 D901 D902 D906

Q210 Q209 Q110 Q108 Q107 Q109 Q904

J302 PHONES

OUTPUT

J101(L) EXT SP 4Ω-8Ω

J201(R) EXT SP 4Ω-8Ω

SP902 SP901 (L-CH)

SP903 SP904 (R-CH)

OUTPUT

CNJ303 DC IN 12V POLARITY

AC INPUT

TOTAL CURRENT

NO TAPE LOADED

REC	330mA(BIAS I,II)
FWD	300mA
FF	300mA
REW	290mA
LINE IN	190mA
FM	240mA
AM	190mA

TO SYSTEM CONTROL BOARD

T901 TRANSFORMER

PLAYBACK SIGNAL INPUT

HRP901

BATTERY, SISE"D"(IEC DESIGNATION R20) 12PCS,12V

A B C D E F G H

1 2 3 4 5

【MAIN BOARD(1)】

Q1 2SC930E FM RF

Q2 2SC930E FM MIXER

Q4 2SC710 FM IF AMP

IC1 K84419 FM/AM IF AMP, FM DET, METER DRIVE

D4 1T40

Q7 2SC945 TUNING LED DRIVE

IC2 LA3361 MPX

D604 SLP241B D605 SLP141B

FM TEL ANT

EXT ANT

D3 SD113 AFC

Q3 2SC930D FM OSC

L3 AM FERRITE-ROD ANT

Q5 2SC710 AM OSC

Q6 2SC710 AM MIXER

D1 1T22 D5 1T22

【MAIN BOARD(2)】

【METER BOARD】

【CONTROL BOARD(2)】

【CONTROL BOARD(1)】

【POWER SUPPLY BOARD】

D104,204 1T40

MIC101 C-1004Q

Q101(201) 2SC1345 PREAMP

L-CH

R-CH

HRP901 RECORD/PLAYBACK HEAD PP18I-3602C

HE901 ERASE HEAD ESF212-36

S301 RECORD/PLAYBACK

IC301 BA328 PREAMP

Q113 2SC945 BUFFER AMP

Q102 2SC945 AMS MUTING

D301 RD3.0E

CNJ302-1 LINE OUT (L)

TO SYSTEM CONTROL BOARD

CNJ301-1 LINE IN/PHONO

Q103(203) 2SC1345 Q104(204) 2SC945 PHONO EQ AMP

Q105(205) 2SC945 Q106(206) 2SC945 REC AMP

Q192(292) 2SC1364 REC MUTE

J301 RECOD/PLAYBACK PLAYBACK RECORD

MIC201 C-1004Q

HRP902 RECORD/PLAYBACK HEAD PP18I-3602C

HE902 ERASE HEAD ESF212-36

CNJ301-2 LINE IN/PHONO

CNJ302-2 LINE OUT (R)

Q202 Q211

Q209 D204

【FRONT JACK BOARD】

Q304 2SD773 BIAS OSC

J301 MIX MIC

S801

Q301 2SC1362 MIXING AMP

Q302 2SC945 MIXING AMP

Q305 2SC945 SWITCHING

Q303 2SC945 MIXING AMP

Q306 2SC945 MUTING

【LIMITER BOARD】

Q191(291) 2SC1364 LIMITER

Q190(290) 2SC945 LIMITER

D190(290) 1T22

Q807 2SA733 AMS LED SWITCHING

【MAIN BOARD(2)】

MAIN BOARD(1)

TO SYSTEM CONTROL BOARD

D603 SLP141B D606 SLP341B

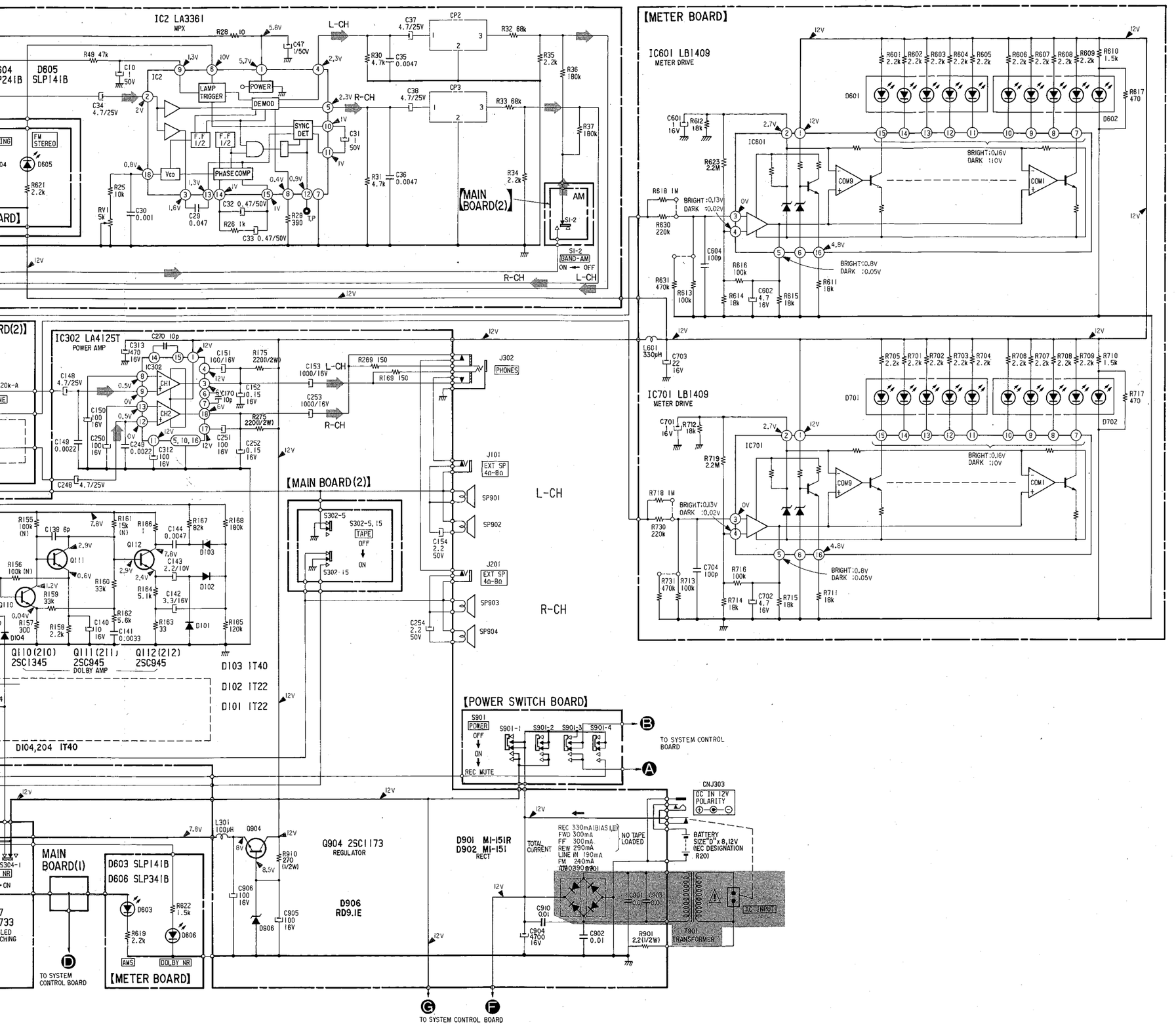
【METER BOARD】

Q107(207) 2SC945 Q108(208) 2SC1345 DOLBY AMP

Q109(209) 2SC1364 DOLBY MUTING

Q110(210) 2SC1345 Q111(211) 2SC945 DOLBY AMP

Q112(212) 2SC945



Note:

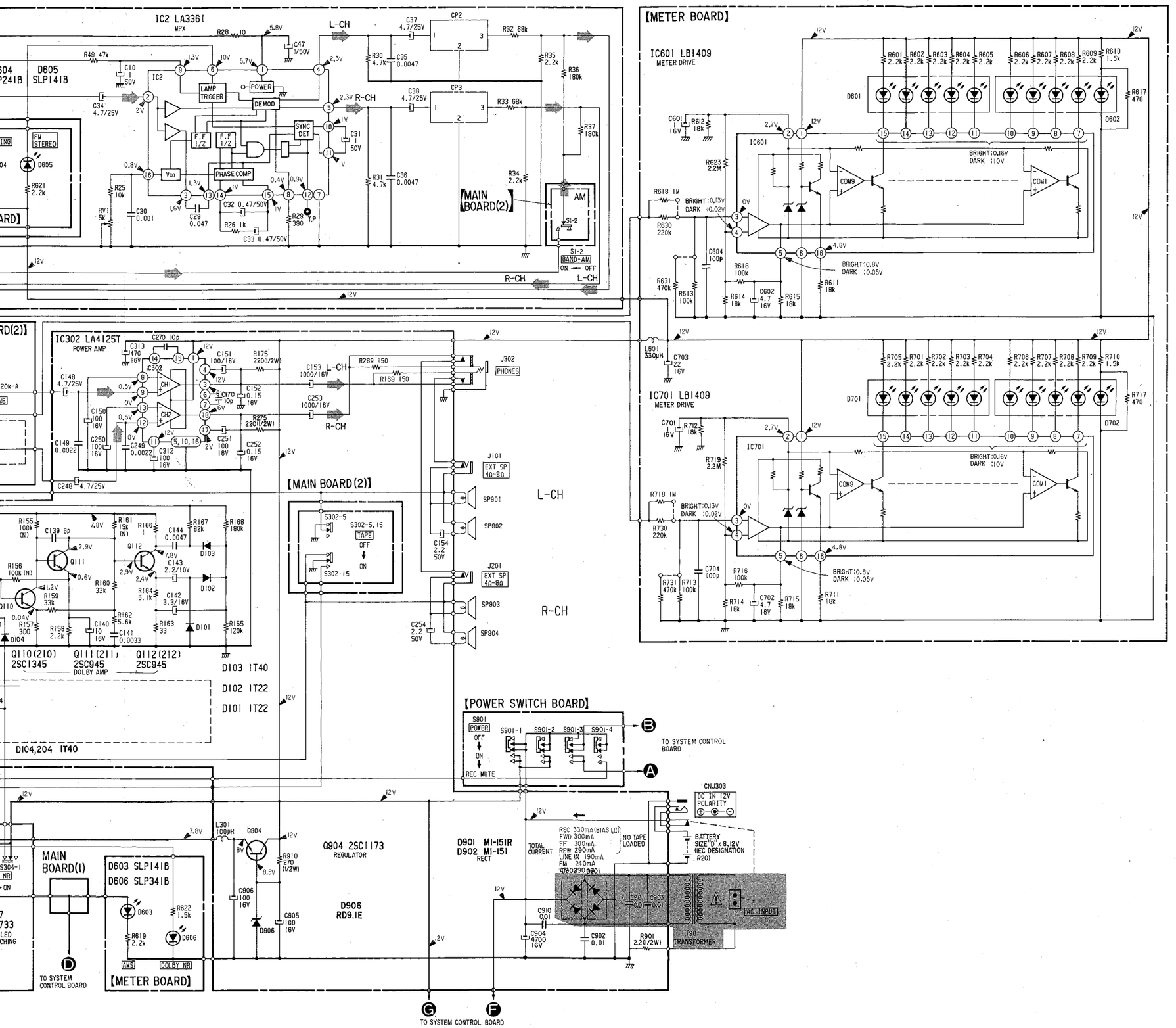
- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ
- △ : internal component.
- ▭ : panel designation.
- ——: B+ bus.
- Readings are taken under no-signal (detuned) conditions with a VOM (20kΩ/V).

  ( ) : AM
  [ ] : REC
- ➡ : signal path
- Switch

Ref. No.	Switch	Position
S1	BAND	FM
S301	REC/PLAYBACK	PLAYBACK
S302-1	TAPE	OFF
S302-2	RADIO	ON
S303-1	CrO_2	OFF
S303-2	METAL	OFF
S303-3	NORM	ON
S304	DOLBY NR	OFF
S305	BIAS	IV
S306	AMS	OFF
S308	PHONO/LINE IN	LINE IN
S309	ISS	1
S901	POWER	OFF

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



Note:

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ
- △ : internal component.
- ▭ : panel designation.
- ——: B+ bus.
- Readings are taken under no-signal (detuned) conditions with a VOM (20kΩ/V).
  ( ) : AM
  [ ] : REC
- ➡ : signal path
- Switch

Ref. No.	Switch	Position
S1	BAND	FM
S301	REC/PLAYBACK	PLAYBACK
S302-1	TAPE	OFF
S302-2	RADIO	ON
S303-1	CrO_2	OFF
S303-2	METAL	OFF
S303-3	NORM	ON
S304	DOLBY NR	OFF
S305	BIAS	IV
S306	AMS	OFF
S308	PHONO/LINE IN	LINE IN
S309	ISS	1
S901	POWER	OFF

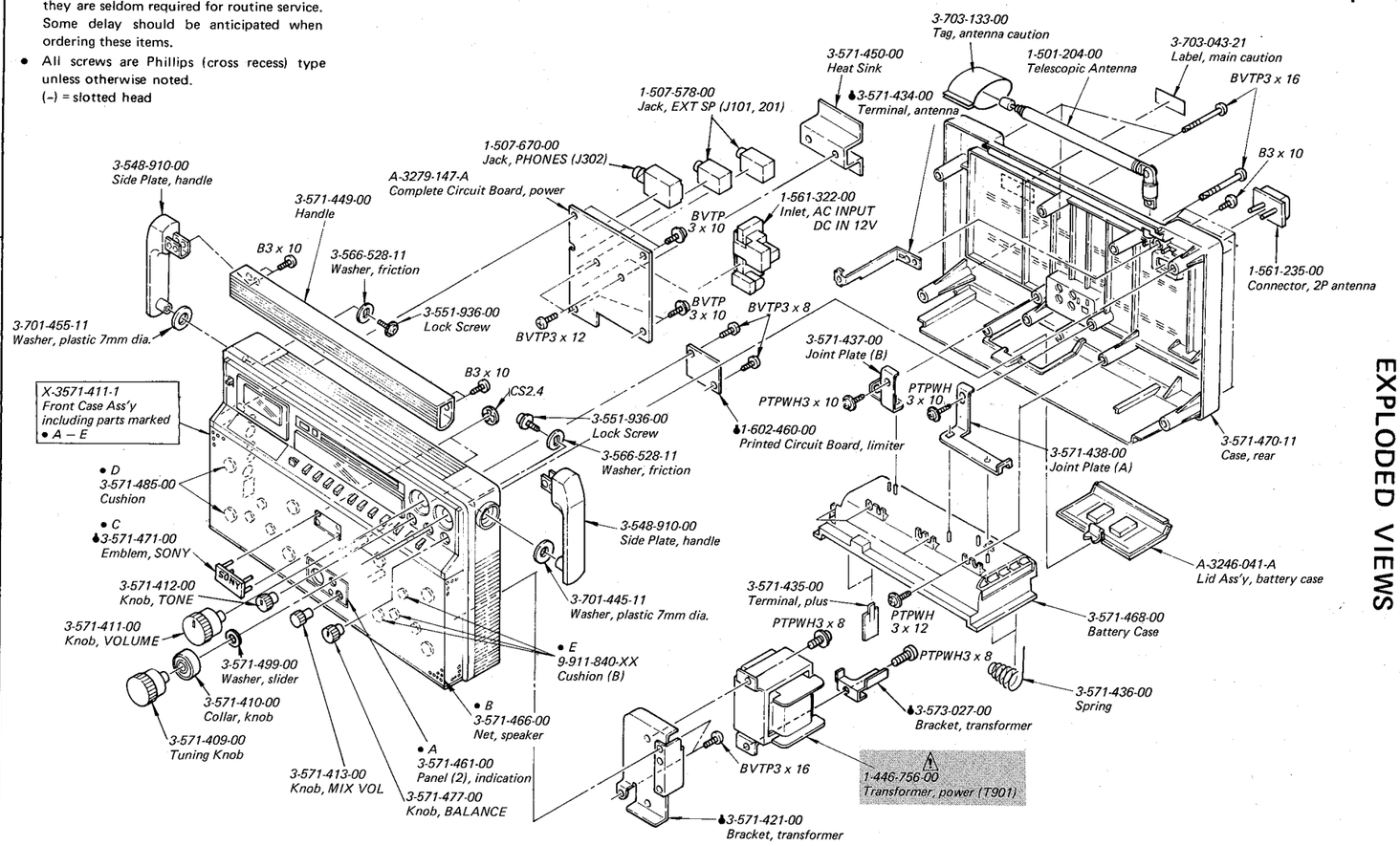
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

5-1.

SECTION 5
EXPLODED VIEWS

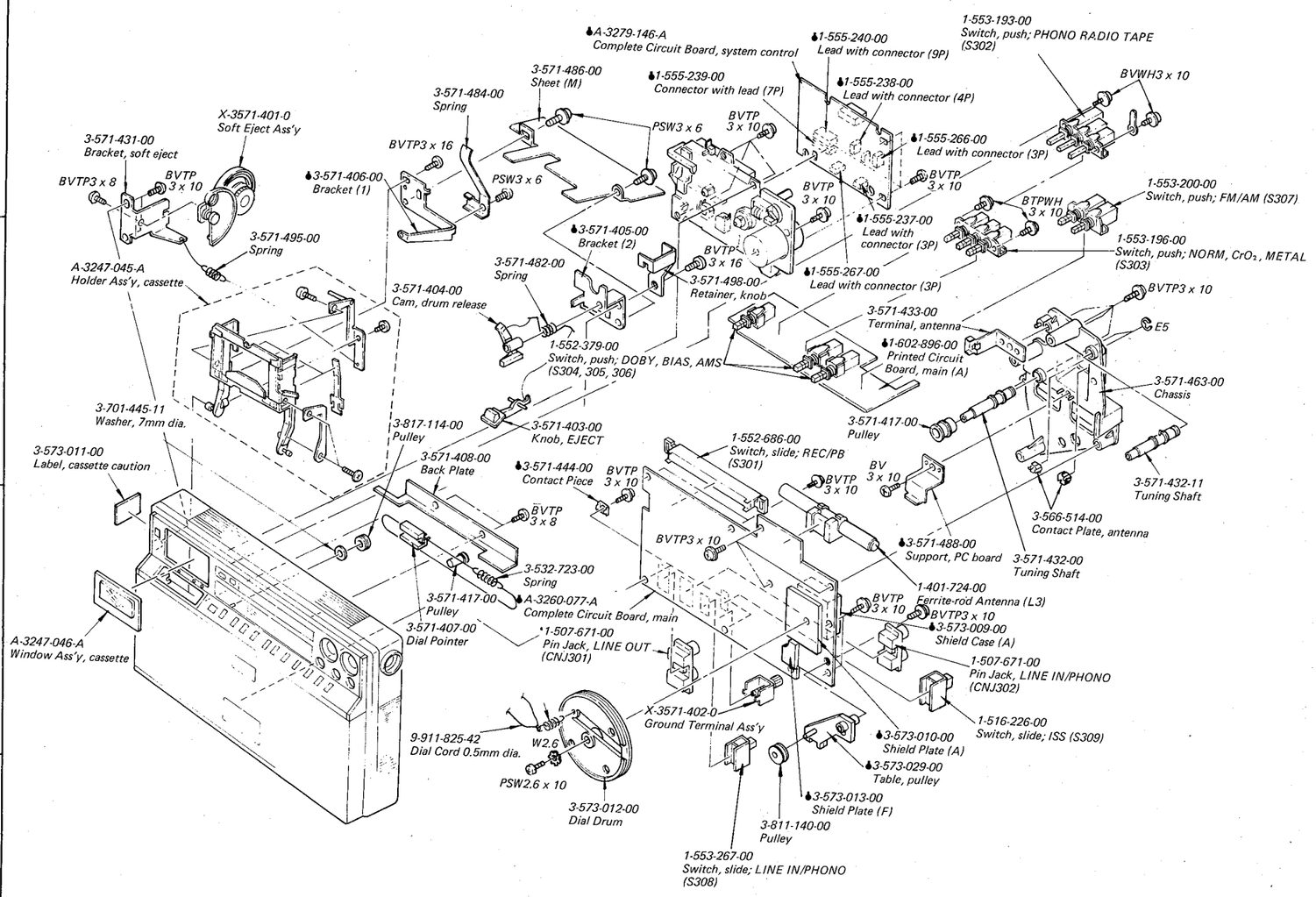
Note:
- Items marked "♦" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All screws are Phillips (cross recess) type unless otherwise noted.
(–) = slotted head



Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

5-2.



5-3.

3-811-140-00
Pulley
1-553-267-00
Switch, slide; LINE IN/PHONO
(S308)
Dial Drum

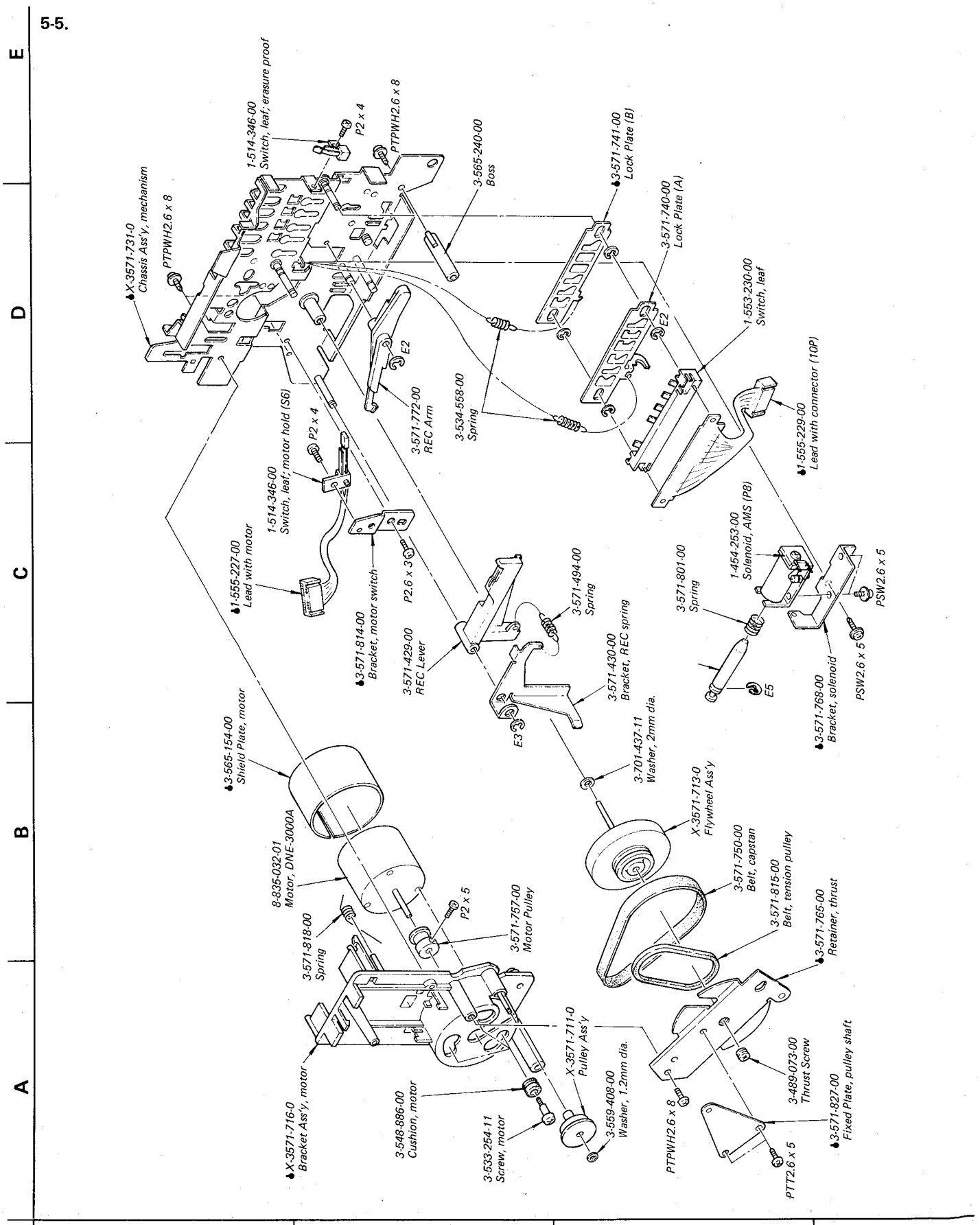
5-3.

PTPWH3 x 10
1-555-268-00
Lead with connector (8P)
1-552-895-00
Speaker, woofer (SP902)
3-571-456-00
Holder (A), LED
3-571-422-00
Holder, drum
3-571-416-00
Bracket, speaker
PTPWH
3 x 10
1-502-884-00
Speaker, tweeter (SP901)
3-571-447-11
Knob
X-3571-405-1
Bracket Ass'y (E)
BVTP3 x 10
3-571-483-00
Shield Plate (E)
1-553-268-00
Switch, slide; POWER (S901)
3-571-474-00
Knob (E)
3-571-447-01
Knob
X-3566-511-1
Knob Ass'y, POWER
A-3279-148-A
Complete Circuit Board, meter
3-566-569-00
Cover, knob
3-491-248-XX
Spring
1-602-905-00
Printed Circuit Board, key switch
3-571-492-00
Cushion
3-571-460-00
Drum (A)
3-571-451-00
Holder (B), LED
1-553-235-00
Switch, FF, REW, FWD, REC
PAUSE, EJECT
1-602-908-00
Printed Circuit Board, L-ECM
1-555-237-00
Cord with connector (3P)
3-571-491-00
Retainer, connector
3-513-076-XX
Spring
3-571-446-00
Holder, microphone
3-571-424-00
Knob, EJECT
TO EXPLODED VIEW 5-2.
1-507-643-00
Jack, MIC MIX (J301)
BVTP3 x 10
1-602-906-00
Printed Circuit Board, eject
3-573-002-00
Reinforcement, stopper
1-602-900-00
Printed Circuit Board, power switch
3-571-443-00
Stopper
8-814-198-91
Microphone; C-1004Q
(MIC101)
1-602-901-00
Printed Circuit Board, model LED
3-571-423-00
Bracket, circuit board
3-571-475-00
Spring (B)
3-571-489-00
Retainer, control
1-602-904-00
Printed Circuit Board, jack
1-561-468-00
Socket, connector; REMOTE
(CNJ301)
1-602-897-00
Printed Circuit Board, control (A)
1-602-898-00
Printed Circuit Board, control (B)
3-571-418-00
Knob, FUNCTION
1-552-412-00
Switch, keyboard; EJECT
(S607)
3-571-443-00
Stopper
1-226-748-00
Resistor, variable 20kΩ-A;
MIC FADER (RV301)
3-571-419-00
Spring (A)
1-226-744-00
Resistor, variable 20kΩ-A;
VOLUME (RV403)
3-571-420-00
Knob, MODE
1-226-749-00
Resistor, variable 100kΩ-W;
BALANCE (RV404)
3-701-769-00
Ornament
1-602-907-00
Printed Circuit Board, R-ECM
PTPWH3 x 10
1-502-895-00
Speaker, woofer (SP904)
1-226-458-00
Resistor, variable 100kΩ-A;
BASS TREBLE (RV401, 402)
3-571-446-00
Holder, microphone
3-566-527-00
Ring
1-555-238-00
Lead with connector (4P)
8-814-198-91
Microphone, C-1004Q (MIC201)
3-571-416-00
Bracket, speaker
1-502-884-00
Speaker, tweeter (SP903)

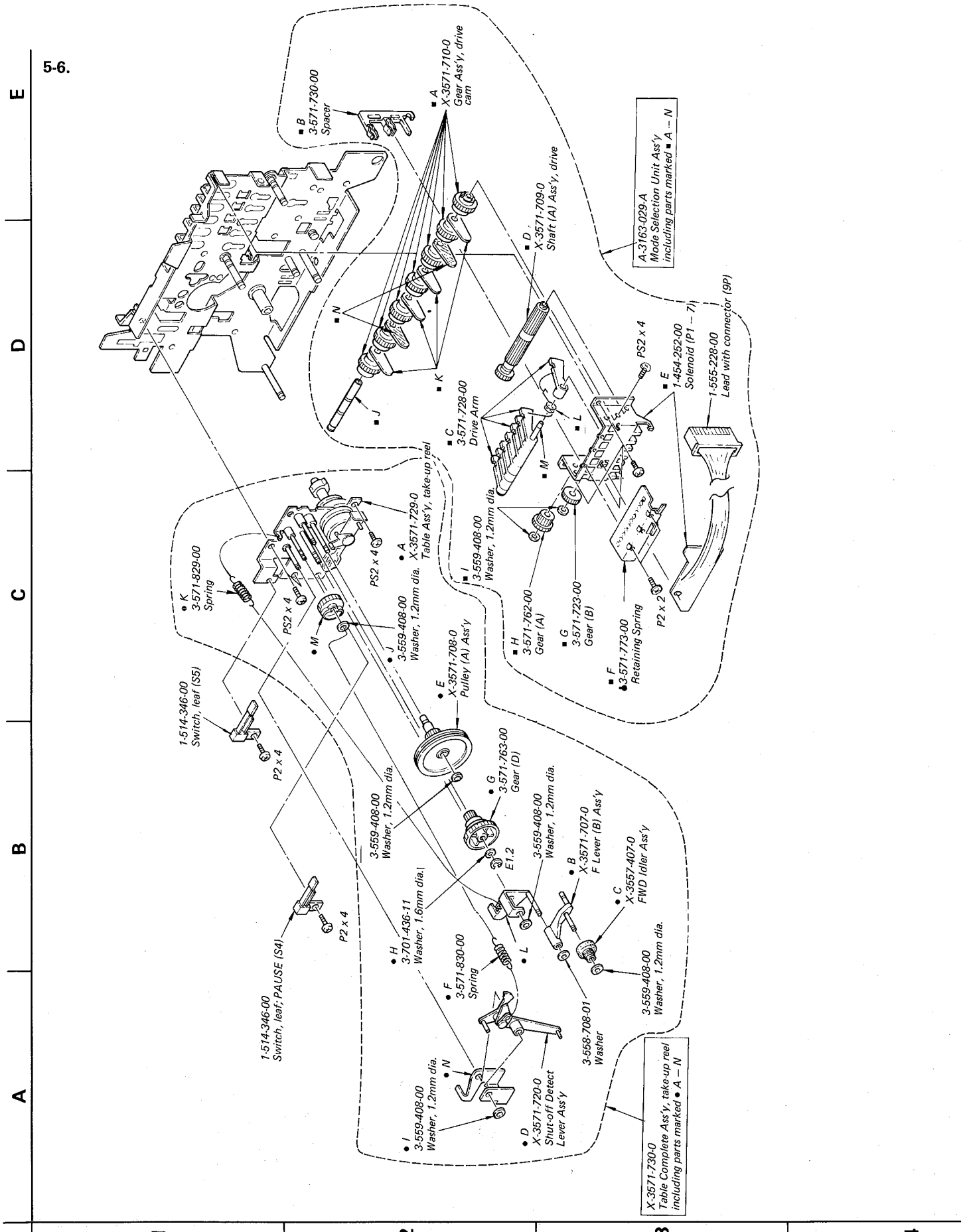
5-4.

3-571-770-00
Lever, erase protection
1-514-346-00
Switch, leaf; AMS (S7)
3-571-771-00
Lock Plate, eject
3-583-541-00
Spring
X-3571-731-0
Mechanism Chassis Ass'y
3-571-820-00
Spring
P2 x 4
X-3571-726-00
EJECT Lever Ass'y
3-642-491-00
Spring
3-571-792-00
FR Selection Lever
3-571-819-00
Spring
X-3571-701-0
FR Slider Ass'y
3-571-832-00
Spring
X-3571-717-00
REC Slider Ass'y
3-571-805-00
Lever, erase head
PTT2.6 x 5
D
3-557-449-00
S Gear (B)
8-658-099-03
Head, erase; ESF212-36
(HE901, 902)
3-571-754-00
Guide, cassette
F
3-559-408-00
Washer, 1.2mm dia.
3-571-716-00
Spring
3-701-468-00
2 x 4
3-571-820-00
Spring
X-3571-728-00
Supply Reel Table Ass'y
including parts marked ▲ A – K
B
3-557-439-00
FR Gear (A)
3-571-803-00
Chassis, head
X-3571-702-00
Slider Ass'y, supply
3-571-760-00
Bracket, head
3-571-754-00
Guide, cassette
3-583-514-00
Washer
E1.2
PTT
2.6 x 5
3-571-748-00
Spring
PTT2.6 x 5
3-571-811-01
Spring
3-513-237-01 (t0.13)
3-513-237-11 (t0.25)
Shim, adjustment
3-506-040-XX
Belt, tape counter
Lug, 3mm dia.
1-548-532-00
Tape Counter
H
3-701-436-01
Washer, t0.13
1.6mm dia.
3-701-465-00
PWH2 x 8
3-539-237-00
Spring
3-571-824-00
Spring
3-571-816-00
Retainer, spring
8-829-373-30
Head, PP181-3602A
(HRP901, 902)
X-3571-703-0
FWD Slider Ass'y
3-571-767-00
Table, supply reel
P2 x 4
C
3-557-440-00
FR Gear (B)
G
3-701-436-11
Washer, t0.25
1.6mm dia.
3-571-823-00
Spring
3-558-708-01
Washer
3-480-160-00
Spring
A
3-547-667-00
Spring
J
X-3571-725-0
FR Lever (B) Ass'y
I
X-3571-724-0
FR Idler Ass'y
X-3571-722-0
Brake Slider Ass'y
E
3-559-408-00
Washer, 1.2mm dia.
3-571-821-00
Spring
3-571-822-00
Spring
3-571-817-00
Spring
X-3571-705-0
Pinch Roller Ass'y
X-3571-718-0
PAUSE Slider Ass'y
3-558-708-21
Washer

5-5.


A
B
C
D
E
1
2
3
4
X-3571-731-0 Chassis Ass'y, mechanism
PTPWH2.6 x 8
1-514-346-00 Switch, leaf; erasure proof
P2 x 4
PTPWH2.6 x 8
3-565-240-00 Boss
3-571-741-00 Lock Plate (B)
3-571-740-00 Lock Plate (A)
E2
1-553-230-00 Switch, leaf
1-555-229-00 Lead with connector (10P)
3-534-558-00 Spring
3-571-772-00 REC Arm
P2 x 4
1-514-346-00 Switch, leaf; motor hold (S6)
1-555-227-00 Lead with motor
3-571-814-00 Bracket, motor switch
P2.6 x 3
3-571-429-00 REC Lever
3-571-494-00 Spring
3-571-430-00 Bracket, REC spring
E3
1-454-253-00 Solenoid, AMS (P8)
3-571-801-00 Spring
E5
3-571-768-00 Bracket, solenoid
PSW2.6 x 5
PSW2.6 x 5
3-565-154-00 Shield Plate, motor
3-701-437-11 Washer, 2mm dia.
X-3571-713-0 Flywheel Ass'y
8-835-032-01 Motor, DNE-3000A
3-571-818-00 Spring
P2 x 5
3-571-757-00 Motor Pulley
3-571-750-00 Belt, capstan
3-571-815-00 Belt, tension pulley
3-571-765-00 Retainer, thrust
X-3571-711-0 Pulley Ass'y
3-559-408-00 Washer, 1.2mm dia.
X-3571-716-0 Bracket Ass'y, motor
3-548-886-00 Cushion, motor
3-533-254-11 Screw, motor
PTPWH2.6 x 8
3-489-073-00 Thrust Screw
PTT2.6 x 5
3-571-827-00 Fixed Plate, pulley shaft

5-6.


■ B 3-571-730-00 Spacer
■ A X-3571-710-0 Gear Ass'y, drive cam
■ D X-3571-709-0 Shaft (A) Ass'y, drive
A-3163-029-A Mode Selection Unit Ass'y including parts marked ■ A – N
■ N
■ K
■ J
■ C 3-571-728-00 Drive Arm
■ M
■ L
PS2 x 4
■ E 1-454-252-00 Solenoid (P1 – 7)
1-555-228-00 Lead with connector (9P)
PS2 x 4
• K 3-571-829-00 Spring
PS2 x 4
• A X-3571-729-0 Table Ass'y, take-up reel
■ I 3-559-408-00 Washer, 1.2mm dia.
• M
• J 3-559-408-00 Washer, 1.2mm dia.
■ H 3-571-762-00 Gear (A)
■ G 3-571-723-00 Gear (B)
P2 x 2
■ F 3-571-773-00 Retaining Spring
1-514-346-00 Switch, leaf (S5)
P2 x 4
• E X-3571-708-0 Pulley (A) Ass'y
3-559-408-00 Washer, 1.2mm dia.
• G 3-571-763-00 Gear (D)
3-559-408-00 Washer, 1.2mm dia.
E1.2
• B X-3571-707-0 F Lever (B) Ass'y
• C X-3557-407-0 FWD Idler Ass'y
1-514-346-00 Switch, leaf; PAUSE (S4)
P2 x 4
• H 3-701-436-11 Washer, 1.6mm dia.
• F 3-571-830-00 Spring
• L
3-559-408-00 Washer, 1.2mm dia.
• I 3-559-408-00 Washer, 1.2mm dia.
• N
• D X-3571-720-0 Shut-off Detect Lever Ass'y
3-558-708-01 Washer
X-3571-730-0 Table Complete Ass'y, take-up reel including parts marked • A – N

SECTION 6
ELECTRICAL PARTS LIST

Ref. No.	*Part No.*	*Description*
	SEMICONDUCTORS	
	Transistors	
Q1–3	8-729-803-04	2SC930
Q4	8-729-671-14	2SC710-14
Q5	8-729-671-13	2SC710-13
Q6	8-729-671-14	2SC710-14
Q7	8-729-663-47	2SC1364
Q101, 201	8-729-665-47	2SC1362
Q102, 202	8-729-663-47	2SC1364
Q103, 203	8-729-665-47	2SC1362
Q104–107, Q204–207	8-729-663-47	2SC1364
Q108, 208	8-729-665-47	2SC1362
Q109, 209	8-729-660-37	2SC1363 blue
Q110, 210	8-729-665-47	2SC1362
Q111–113, Q211–213, Q190–192, Q290–292	8-729-663-47	2SC1364
Q301	8-729-665-47	2SC1362
Q302, 303	8-729-663-47	2SC1364
Q304	8-729-177-32	2SD773
Q305, 306	8-729-663-47	2SC1364
Q501	8-729-177-32	2SD773
Q502, 503	8-729-663-47	2SC1364
Q504	8-729-177-32	2SD773
Q505	8-729-663-47	2SC1364
Q506	8-729-177-32	2SD773
Q507	8-729-663-47	2SC1364
Q508	8-729-177-32	2SD773
Q509	8-729-663-47	2SC1364
Q510	8-729-177-32	2SD773
Q511	8-729-663-47	2SC1364
Q512, 513	8-729-177-32	2SD773
Q514	8-729-612-77	2SA1027R
Q515	8-729-663-47	2SC1364
Q516	8-729-612-77	2SA1027R
Q517	8-729-217-33	2SC1173
Q518, 519	8-729-612-77	2SA1027R
Q801	8-729-665-47	2SC1362
Q802–804	8-729-663-47	2SC1364
Q805	8-729-199-80	2SD998
Q807	8-729-612-77	2SA1027R
Q904	8-729-217-33	2SC1173
	ICs	
IC1	8-759-944-19	KB4419
IC2	8-759-833-61	LA3361
IC301	8-759-932-80	BA328
IC302	8-759-801-25	LA4125T
IC601, 701	8-759-804-09	LB1409
	Diodes	
D1	8-719-422-21	1T22AM
D2	8-719-162-07	RD6.2E
D3	8-719-768-71	1S2687S-1
D4	8-719-815-55	1S1555
D5	8-719-422-21	1T22AM
D101, 201, D102, 202	8-719-422-21	1T22AM
D103, 203	8-719-815-55	1S1555
D301	8-719-130-07	RD3.0E
D501–530	8-719-815-55	1S1555
D531	8-719-191-07	RD9.1E
D560	8-719-900-93	V09C
D603	8-719-900-41	SLP141B
D604	8-719-922-41	SLP241B
D605	8-719-900-41	SLP141B
D606	8-719-903-41	SLP341B
D801, 802	8-719-815-55	1S1555
D901	⚠ 8-719-501-34	S3VC40R
D902	⚠ 8-719-500-34	S3VC40
D906	8-719-191-07	RD9.1E
D1001	8-719-902-31	SLP231B
D1002	8-719-901-31	SLP131B
D1003	8-719-902-31	SLP231B
D601, 701	1-806-013-11	SLP-152B

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

- Items marked "♦" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

Ref. No.	*Part No.*	*Description*
D602, 702	1-806-013-11	SLP-152B

RESISTORS

All resistors are in ohms. Common ¼W carbon resistors are omitted. Refer to the list on the last page for their part numbers.
kΩ : 1000Ω, MΩ : 1000kΩ

RV1	1-226-235-00	5k-B, adjustable
RV101, 201	1-226-233-00	1k-B, adjustable
RV102, 202	1-226-238-00	50k-B, adjustable
RV301	1-226-748-00	20k-A, variable; MIC FADER
RV401, 402	1-226-458-00	100k/100k-A, variable; BASS TREBLE
RV403, 453	1-226-744-00	20k/20k-A, variable; VOLUME
RV404	1-226-749-00	100k-W, variable; BALANCE

MISCELLANEOUS

CF1, 2	1-527-184-XX	Ceramic Filter, 10.7MHz
CNJ301	1-561-468-00	Socket, connector; REMOTE (DIN 8P)
CNJ301-1,~2 CNJ302-1,~2	1-507-671-00	Pin Jack, 2P; LINE IN/PHONO LINE OUT
CNJ303	⚠ 1-561-322-00	Inlet, AC INPUT, DC IN 12V
CP1	1-231-286-00	Bandpass Filter
CP2, 3	1-231-303-00	Lowpass Filter
CT1–4	1-151-361-00	Tuning Capacitor
CT101, 201	1-141-181-11	Trimmer
CV1–4	1-151-361-00	Tuning Capacitor
J101, 201	1-507-578-00	Jack, EXT SP
J301	1-507-643-00	Jack, MIX MIC
J302	1-507-670-00	Jack, PHONES
HE901, 902	8-658-099-03	Erase Head, ESF212-36
HRP901,902	8-829-373-30	Head, record/playback; PP181-3602A
L1	♦ 1-425-867-00	Coil, FM RF
L2	1-459-266-00	Coil, with core
L3	1-401-724-00	MW Ferrite-rod Antenna
L4	1-408-092-00	Microinductor, 330μH
L5	1-401-454-00	FM Antenna Coil
L101, 201	1-408-217-00	Microinductor, 6.8mH
L301	1-408-080-00	Microinductor, 100μH
L601	1-408-201-00	Microinductor, 330μH
M	8-835-032-01	Motor, DNE-3000A
MIC101,201	8-814-198-91	Microphone, C-1004Q
P1–7	1-454-252-00	Solenoid
P8	1-454-253-00	Solenoid, AMS
S1	1-553-200-00	Switch, push; FM/AM
S2	1-514-346-00	Switch, leaf; erasure proof
S4–7	1-514-346-00	Switch, leaf
S5	1-553-230-00	Switch, leaf
S301	1-552-686-00	Switch, slide; record/playback
S302	1-553-193-00	Switch, push; PHONO RADIO TAPE
S303	1-553-196-00	Switch, push; NORM METAL CrO_2
S304–306	1-552-379-00	Switch, push; AMS DOLBY BIAS
S308	1-553-267-00	Switch, slide; LINE IN/PHONO
S309	1-516-226-00	Switch, slide; ISS
S601–606	1-553-235-00	Switch, keyboard; EJECT FF REW FWD REC PAUSE
S607	1-552-412-00	Switch, keyboard; EJECT
S901	1-553-268-00	Switch, slide; POWER
SP901,903	1-502-895-00	Speaker, woofer
SP902,904	1-502-884-00	Speaker, tweeter; 5cm
T1	1-403-872-00	FM IFT
T2	1-404-249-00	FM Det Coil
T3	1-403-137-00	Det IFT
T4	1-405-655-00	MW OSC Coil
T5	1-403-163-00	Ceramic Filter
T101, 201 T102, 202	1-409-334-00	Trap Coil
T301	1-433-222-00	Bias, Osc Transformer
T901	⚠ 1-446-756-00	Transformer, power
	1-501-204-00	Telescopic Antenna
	1-548-532-00	Tape Counter

Complete Circuit Board

♦ A-3260-077-A	Main
♦ A-3279-146-A	System Control
♦ A-3279-147-A	Power
♦ A-3279-148-00	Meter

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	*Part No.*	*Description*
		Printed Circuit Board
●	1-602-460-00	Limiter
●	1-602-895-00	Main (A)
●	1-602-896-00	Main (B)
●	1-602-897-00	Control (A)
●	1-602-998-00	Control (B)
●	1-602-899-00	Meter
●	1-602-900-00	Power Switch
●	1-602-901-00	Mode LED
●	1-602-902-00	Power
●	1-602-903-00	System Control
●	1-602-904-00	Jack
●	1-602-905-00	Key Switch
●	1-602-906-00	Eject
●	1-602-907-00	Microphone (R)
●	1-602-908-00	Microphone (L)
		Lead with connector
●	1-555-227-00	8P
●	1-555-228-00	9P
●	1-555-229-00	10P
●	1-555-238-00	8P
●	1-555-239-00	7P
●	1-555-240-00	9P
●	1-555-266-00	3P
●	1-555-267-00	3P

ACCESSORIES AND PACKING MATERIALS

Part No.	*Description*
⚠ 1-551-504-00	Cord, power; DK-35A
1-561-235-00	Connector, 2P antenna
3-566-582-00	Bag, protection
3-571-476-00	Cushion
3-573-024-00	Carton
3-573-028-00	Sticker (US model)
3-701-632-00	Bag, plastic
3-783-100-21	Manual, instruction
3-794-894-31	Manual, French (Canadian model)
8-890-433-10	Tape, SHF-46 (Canadian model)
8-893-521-10	Tape, CD-810

Note:

- Items marked "●" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

ELECTROLYTIC CAPACITORS

CAP. (μF)	RATING → : Use the high voltage rated one.					
	6.3 VOLT.	10 VOLT.	16 VOLT.	25 VOLT.	35 VOLT.	50 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.47					→	1-121-726-00
1.0					→	1-121-391-00
2.2					→	1-121-450-00
3.3	→	→	→	1-121-392-00	→	1-121-393-00
4.7	→	→	→	1-121-395-00	→	1-121-396-00
10	→	→	1-121-651-00	1-121-398-00	→	1-121-738-00
22	→	→	1-121-479-00	1-121-480-00	1-121-662-00	1-121-152-00
33	→	→	1-121-403-00	1-121-404-00	1-121-652-00	1-121-405-00
47	→	1-121-352-00	1-121-409-00	1-121-410-00	1-121-653-00	1-121-411-00
100	→	1-121-414-00	1-121-415-00	1-121-416-00	1-121-357-00	1-121-417-00
220	1-121-419-00	1-121-420-00	1-121-421-00	1-121-422-00	1-121-261-00	1-121-423-00
330	1-121-751-00	1-121-805-00	1-121-521-00	1-121-654-00	1-121-655-00	1-121-656-00
470	1-121-424-00	1-121-425-00	1-121-426-00	1-121-733-00	1-121-361-00	1-121-810-00
1000	–	1-121-736-00	1-121-245-00	1-121-657-00	1-121-388-00	1-123-061-00
2200	1-121-658-00	1-121-659-00	1-121-660-00	1-123-067-00	1-121-984-00	–
3300	1-121-661-00	1-123-075-00	1-123-071-00	–	–	–

CAP. (μF)	100 VOLT.	160 VOLT.	250 VOLT.	350 VOLT.
	PART No.	PART No.	PART No.	PART No.
0.47	–	–	–	–
1.0	1-123-249-00	1-123-252-00	1-123-003-00	1-121-168-00
2.2	1-123-250-00	1-123-026-00	–	1-123-028-00
3.3	1-121-995-00	–	1-123-004-00	1-123-006-00
4.7	1-123-255-00	1-121-246-00	1-121-759-00	1-123-007-00
10	1-121-126-00	1-121-999-00	1-123-254-00	1-123-008-00
22	1-121-996-00	1-123-253-00	1-123-005-00	1-123-022-00
33	1-121-997-00	1-121-757-00	–	–
47	1-123-251-00	1-121-919-00	–	–
100	1-123-084-00	–	–	–

CERAMIC CAPACITORS

CAP. (pF)	RATING 50 VOLT. PART No.	CAP. (pF)	50 VOLT. PART No.	CAP. (pF)	50 VOLT. PART No.	CAP. (μF)	50 VOLT. PART No.
0.5	1-101-837-00	22	1-102-959-00	150	1-101-361-00	0.001	1-102-074-00
0.75	1-101-586-00	24	1-102-960-00	160	1-101-367-00	0.0012	1-102-118-00
1.0	1-102-934-00	27	1-102-961-00	180	1-102-976-00	0.0015	1-102-119-00
1.5	1-101-576-00	30	1-102-962-00	200	1-102-977-00	0.0018	1-102-120-00
2.0	1-102-935-00	33	1-102-963-00	220	1-102-978-00	0.0022	1-102-121-00
3	1-102-936-00	36	1-102-964-00	240	1-102-979-00	0.0027	1-102-122-00
4	1-102-937-00	39	1-102-965-00	270	1-102-980-00	0.0033	1-102-123-00
5	1-102-942-00	43	1-102-966-00	300	1-102-981-00	0.0039	1-102-124-00
6	1-102-943-00	47	1-101-880-00	330	1-102-820-00	0.0047	1-102-125-00
7	1-102-944-00	51	1-101-882-00	360	1-102-821-00	0.0056	1-102-126-00
8	1-102-945-00	56	1-101-884-00	390	1-102-822-00	0.0068	1-102-127-00
9	1-102-946-00	62	1-101-886-00	430	1-102-823-00	0.0082	1-102-128-00
10	1-102-947-00	68	1-101-888-00	470	1-102-824-00	0.01	1-102-129-00
11	1-102-948-00	75	1-101-890-00	510	1-101-059-00	0.022	1-101-005-00
12	1-102-949-00	82	1-102-971-00	560	1-102-115-00	0.047	1-101-006-00
13	1-102-950-00	91	1-102-972-00	680	1-102-116-00		
15	1-102-951-00	100	1-102-973-00	820	1-102-117-00		
16	1-102-952-00	110	1-102-815-00				
18	1-102-953-00	120	1-102-816-00				
20	1-102-958-00	130	1-101-081-00				

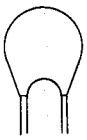
0.001μF = 1,000pF

CERAMIC (SEMICONDUCTOR) CAPACITORS

CAP. (μF)	RATING → : Use the high voltage rated one. 25 VOLT. PART No.	50 VOLT. PART No.	CAP. (μF)	25 VOLT. PART No.	50 VOLT. PART No.
0.001	→	1-161-039-00	0.018	1-161-016-00	1-161-054-00
0.0012	→	1-161-040-00	0.022	1-161-017-00	1-161-055-00
0.0015		1-161-041-00	0.027	1-161-018-00	1-161-056-00
0.0018		1-161-042-00	0.033	1-161-019-00	1-161-057-00
0.0022		1-161-043-00	0.039	1-161-010-00	1-161-058-00
0.0027	→	1-161-044-00	0.047	1-161-021-00	1-161-059-00
0.0033	→	1-161-045-00	0.056	→	1-161-060-00
0.0039	→	1-161-046-00	0.068	→	1-161-061-00
0.0047	→	1-161-047-00	0.082	1-161-024-00	1-161-062-00
0.0056	→	1-161-048-00	0.1	1-161-025-00	1-161-063-00
0.0068	→	1-161-049-00			
0.0082	1-161-012-00	1-161-050-00			
0.01	1-161-013-00	1-161-051-00			
0.012	→	1-161-052-00			
0.015	1-161-015-00	1-161-053-00			

MYLAR CAPACITORS

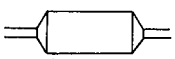
CAP. (μF)	RATING 50 VOLT. PART No.	100 VOLT. PART No.	200 VOLT. PART No.	CAP. (μF)	50 VOLT. PART No.	100 VOLT. PART No.	200 VOLT. PART No.	CAP. (μF)	50 VOLT. PART No.	100 VOLT. PART No.	200 VOLT. PART No.
0.001	1-108-227-00	1-108-365-00	1-108-409-00	0.01	1-108-239-00	1-108-377-00	1-108-421-00	0.1	1-108-251-00	1-108-389-00	1-108-433-00
0.0012	1-108-351-00	1-108-366-00	1-108-410-00	0.012	1-108-357-00	1-108-378-00	1-108-422-00	0.12	1-108-363-00	1-108-390-00	1-108-434-00
0.0015	1-108-228-00	1-108-367-00	1-108-411-00	0.015	1-108-240-00	1-108-379-00	1-108-423-00	0.15	1-108-252-00	1-108-391-00	1-108-435-00
0.0018	1-108-352-00	1-108-368-00	1-108-412-00	0.018	1-108-358-00	1-108-380-00	1-108-424-00	0.18	1-108-364-00	1-108-392-00	1-108-436-00
0.0022	1-108-230-00	1-108-369-00	1-108-413-00	0.022	1-108-242-00	1-108-381-00	1-108-425-00	0.22	1-108-254-00	1-108-393-00	1-108-437-00
0.0027	1-108-353-00	1-108-370-00	1-108-414-00	0.027	1-108-359-00	1-108-382-00	1-108-426-00	0.27	1-108-854-00	–	–
0.0033	1-108-232-00	1-108-371-00	1-108-415-00	0.033	1-108-244-00	1-108-383-00	1-108-427-00	0.33	1-108-855-00	–	–
0.0039	1-108-354-00	1-108-372-00	1-108-416-00	0.039	1-108-360-00	1-108-384-00	1-108-428-00	0.39	1-108-856-00	–	–
0.0047	1-108-234-00	1-108-373-00	1-108-417-00	0.047	1-108-246-00	1-108-385-00	1-108-429-00	0.47	1-108-857-00	–	–
0.0056	1-108-355-00	1-108-374-00	1-108-418-00	0.056	1-108-361-00	1-108-386-00	1-108-430-00				
0.0068	1-108-237-00	1-108-375-00	1-108-419-00	0.068	1-108-249-00	1-108-387-00	1-108-431-00				
0.0082	1-108-356-00	1-108-376-00	1-108-420-00	0.082	1-108-362-00	1-108-388-00	1-108-432-00				



TANTALUM CAPACITORS

→ : Use the high voltage rated one.

CAP. (μF)	RATING 3.15 VOLT. PART No.	6.3 VOLT. PART No.	10 VOLT. PART No.	16 VOLT. PART No.	20 VOLT. PART No.	25 VOLT. PART No.	35 VOLT. PART No.
0.01					→	→	1-131-396-00
0.015						→	1-131-397-00
0.022						→	1-131-398-00
0.033						→	1-131-399-00
0.047						→	1-131-400-00
0.068					→	→	1-131-401-00
0.1					→	→	1-131-402-00
0.15					→	→	1-131-403-00
0.22					→	→	1-131-404-00
0.33					→	1-131-409-00	1-131-405-00
0.47	–	–	–	–	1-131-412-00	→	1-131-406-00
0.68	–	–	–	1-131-415-00	→	1-131-410-00	1-131-407-00
1.0	–	–	1-131-418-00	–	1-131-413-00	→	1-131-408-00
1.5	–	1-131-421-00	–	1-131-416-00	→	1-131-411-00	1-131-348-00
2.2	1-131-424-00	–	1-131-419-00	–	1-131-414-00	1-131-355-00	1-131-349-00
3.3	–	1-131-422-00	–	1-131-417-00	1-131-362-00	1-131-356-00	1-131-350-00
4.7	1-131-425-00	–	1-131-420-00	1-131-369-00	1-131-363-00	1-131-357-00	1-131-351-00
6.8	–	1-131-423-00	1-131-376-00	1-131-370-00	1-131-364-00	1-131-358-00	1-131-352-00
10	1-131-426-00	1-131-383-00	1-131-377-00	1-131-371-00	1-131-365-00	1-131-359-00	1-131-353-00
15	1-131-390-00	1-131-384-00	1-131-378-00	1-131-372-00	1-131-366-00	1-131-360-00	–
22	1-131-391-00	1-131-385-00	1-131-379-00	1-131-373-00	1-131-367-00		
33	1-131-392-00	1-131-386-00	1-131-380-00	1-131-374-00			
47	1-131-393-00	1-131-387-00	1-131-381-00	–			
68	1-131-394-00	1-131-388-00	–	–			
100	1-131-395-00	–	–	–			



TANTALUM CAPACITORS

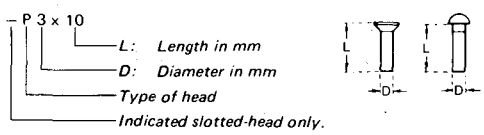
CAP. (μF)	RATING 3 VOLT. PART No.	6.3 VOLT. PART No.	10 VOLT. PART No.	16 VOLT. PART No.	20 VOLT. PART No.	35 VOLT. PART No.
0.033						1-131-273-00
0.047						1-131-274-00
0.068						1-131-275-00
0.1						1-131-276-00
0.15						1-131-277-00
0.22			–	–	1-131-262-00	1-131-278-00
0.33			–	–	1-131-263-00	1-131-279-00
0.47			1-131-169-00	–	1-131-264-00	1-131-280-00
0.68			–	1-131-258-00	1-131-265-00	1-131-281-00
1.0			1-131-254-00	–	1-131-266-00	1-131-282-00
1.5		1-131-250-00	–	–	1-131-267-00	1-131-283-00
2.2		–	–	1-131-259-00	1-131-268-00	1-131-284-00
3.3		–	1-131-255-00	–	1-131-269-00	–
4.7		1-131-251-00	1-131-171-00	–	1-131-270-00	–
6.8		–	–	1-131-260-00	1-131-271-00	–
10	–	–	1-131-256-00	–	1-131-272-00	–
15	–	1-131-252-00	–	1-131-261-00		
22	–	–	1-131-257-00	–		
33	1-131-176-00	1-131-253-00	1-131-173-00	–		
47	1-131-288-00	1-131-174-00	–	–		
100	1-131-177-00					

1/4 WATT CARBON RESISTORS

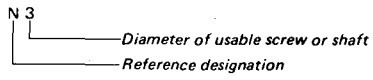
Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	1.1M	1-210-814-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00	1.2M	1-210-815-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-576-00	13k	1-246-500-00	130k	1-246-524-00	1.3M	1-210-816-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-577-00	15k	1-246-501-00	150k	1-246-525-00	1.5M	1-210-817-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-578-00	16k	1-246-502-00	160k	1-246-526-00	1.6M	1-210-818-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-579-00	18k	1-246-503-00	180k	1-246-527-00	1.8M	1-210-819-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-580-00	20k	1-246-504-00	200k	1-246-528-00	2.0M	1-210-820-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-581-00	22k	1-246-505-00	220k	1-246-529-00	2.2M	1-210-821-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-582-00	24k	1-246-506-00	240k	1-246-530-00	2.4M	1-244-754-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-583-00	27k	1-246-507-00	270k	1-246-531-00	2.7M	1-244-755-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-584-00	30k	1-246-508-00	300k	1-246-532-00	3.0M	1-244-756-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-585-00	33k	1-246-509-00	330k	1-246-533-00	3.3M	1-244-757-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-586-00	36k	1-246-510-00	360k	1-246-534-00	3.6M	1-244-758-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-587-00	39k	1-246-511-00	390k	1-246-535-00	3.9M	1-244-759-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00	4.3M	1-244-760-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00	4.7M	1-244-761-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00	5.1M	1-244-762-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00		
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00		
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00		

HARDWARE NOMENCLATURE

Screw:



Nut, Washer, Retaining ring:



Reference Designation	Shape	Description	Remarks
		SCREWS	
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		braizer-head screw	

Reference Designation	Shape	Description	Remarks
		SELF-TAPPING SCREWS	
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
		SET SCREWS	
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
		NUT	
N		nut	
		WASHERS	
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
		RETAINING RINGS	
E		retaining ring	
G		grip-type retaining ring	

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